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ABSTRACT

A study investigated the effectiveness of the Pennsylvania Governor's School for the Agricultural Sciences (PGSAS) in stimulating high school students' interest in agriculture. It explored whether PGSAS provided participants with experiences and information that expanded their knowledge of educational and career opportunities related to the science, technology, and policy of food, agriculture, and natural resources. It also studied whether the PGSAS experience provided participants with an opportunity to explore scientific concepts, interact with professional scientists, and use research techniques. A questionnaire was mailed to 313 past program participants; a 75.1 percent usable response was received. Participants rated PGSAS, father, and mother as having some influence on choice of college major; they rated psychological determinants as having a strong influence. Participants rated a person employed in the profession, PGSAS, father, and mother as having the most influence on their choice of a career. Their current perceptions of educational and career opportunities in or related to food, agriculture, and natural resources were for the most part very positive. One-fifth classified choice of majors and future career as being in or related to food, agriculture, and natural resources. Overall, participants perceived they benefited from and were satisfied with their research experience. (Appendixes include a list of 38 references, PGSAS program description, and questionnaires.) (YLB)

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The Pennsylvania State University

The Graduate School

Department of Agricultural and Extension Education

FOLLOW-UP OF PENNSYLVANIA GOVERNOR'S SCHOOL FOR THE AGRICULTURAL SCIENCES PROGRAM PARTICIPANTS

A Thesis in

Agricultural Education

by

Marianne L. Houser

Submitted in Partial Fulfillment
of the Requirements
for the Degree of

Doctor of Philosophy

August 1991

CE060483

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ABSTRACT

The primary purpose of this study was to determine if the Pennsylvania Governor's School for the Agricultural Sciences (PGSAS) provided program participants with experiences and information which expanded their knowledge of educational and career opportunities related to the science, technology and policy of food, agriculture and natural resources. A second purpose was to determine if the Governor's School experience provided program participants with an opportunity to explore scientific concepts, interact with professional scientists and to use research techniques available in the agricultural sciences. A questionnaire was developed and mailed to the population of 313 past program participants of the Pennsylvania Governor's School for the Agricultural Sciences. Information was obtained relative to future education and career plans, immediate career plans, current perceptions regarding careers in or related to food, agriculture and natural resources, personal growth and development and sociodemographic characteristics of PGSAS participants. A 75.1 percent usable response was received.

PGSAS program participants rated PGSAS, father and mother as having some degree of influence on choice of a college major. Program participants rated psychological determinants including personal interests, personal happiness, personal ability and skills and career interests as having a strong influence on their choice of a college major. Slight differences occurred between program participants ratings of the relative influence of individuals, experiences and personal factors on choice of a college major when considering participants' residence, high school course of study, membership in selected youth organizations, decision about a college major and parents' educational level serving as a proxy measure of socioeconomic status.

Program participants rated a person employed in the profession, PGSAS, father and mother as the individuals and experiences having the most influence on their choice of a career. Program participants rated personal interests, personal happiness and personal

ability and skills as having a strong influence on their choice of career. Slight differences occurred between program participants' influence ratings of individuals, experiences and factors influencing their choice of a career when considering father's level of education, residence status and college major decision. Program participants' current perceptions of educational and career opportunities in or related to food, agriculture and natural resources were for the most part very positive.

Over half (59.5%) of the program participants plan to attend graduate school. Almost 40 percent plan to earn a Doctor of Philosophy degree. One-fifth classified their choice of graduate or professional majors as related to food, agriculture and natural resources including veterinary medicine. One-fifth of the participants also classified their future career as being in or related to food, agriculture and natural resources.

Overall program participants perceived that they benefited and were satisfied with their research experience during the Governor's School program. Program participants rated writing research reports, conducting individual research and learning research techniques as being the most beneficial aspects of the research aspect of PGSAS.

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Chapter 1

INTRODUCTION

Background and Setting

Wolf, in the 1986 Yearbook of Agriculture, Research For Tomorrow, wrote that United States agriculture is a global enterprise with assets exceeding one trillion dollars. Wolf reported U.S. agriculture accounts for 20 percent of the nation's gross national product. He claimed that more than 23 million Americans (20 percent of the American labor force) are employed in agriculture-related jobs.

Wolf contended United States agriculture is the center of international business and finance, with agricultural professionals employed in brokerage houses, investment banks, international trading companies, advertising agencies, and boardrooms of national and international corporations.

Wolf contended many agriculture and food specialists are at the forefront of science and technology, with developments ranging from new techniques to improve the productivity and cost efficiency of American farms, to new and better food products to enhance consumer health, welfare and satisfaction. Wolf indicated there is a significant need in the United States for professionals with expertise in the food and agricultural sciences if this country is to remain competitive in scientific developments and technology. To remain competitive an educated agricultural workforce with expertise in scientific concepts is required from a revitalized educational system starting at the elementary through secondary school setting. President Bush and the nation's governors have called for world class standards in English, math, science, history and geography in their plan to revitalize education by the year 2000 (Gentzel, 1991). Such an emphasis should be beneficial in developing basic skills needed by agricultural professionals.

In 1990, Coulter, Stanton and Goecker updated their 1986 report titled Employment Opportunities For College Graduates in the Food and Agricultural Sciences. The report revealed that through the mid-1990s there would be an excess of 49,000 annual employment opportunities for qualified graduates in food, agriculture and natural resources. The report indicated that of the 49,000 annual employment opportunities, 32 percent are in marketing, merchandising and sales; including areas such as grain merchandising, insurance, timber sales and food brokerage. Twenty-nine percent of the employment opportunities are for scientists, engineers and related specialists, while 14 percent are projected in the areas of management and finance. About one-half of the opportunities described are classified in the report as agribusiness. Other significant opportunities are reported in production agriculture, social service professions, the field of education, communication and forestry. The report predicted an annual shortage of 11 percent of qualified graduates through the mid-1990s.

According to Coulter (1985), between 1977 and 1983 baccalaureate enrollments in colleges of agriculture declined approximately 30 percent. For this same time period, Coulter also reported graduate enrollments in agriculture diminished by 5 percent. Coulter found that between 1977 and 1982, total U.S. college enrollments were continuing to increase and that total college enrollments did not begin declining until 1983.

According to the abridged fall 1989 enrollment information reported in the June 1990 *Journal of the National Association of Colleges and Teachers of Agriculture* (NACTA), nearly one-half of the 70 reporting colleges experienced increased enrollments. The size of the freshman class of 1989 was about the same as the freshman class of 1988. All academic areas showed increased enrollments with natural resources showing the largest increases (up 17% from 1988). Enrollment in masters and doctoral programs continued to decline. It appears that earlier declining numbers of baccalaureate graduates in the agricultural and natural resource sciences have begun to effect graduate enrollment.

Table 1 presents a summary of 1988 and 1989 fall enrollments by program area and level in member institutions of the National Association of State Universities and Land Grant Colleges (NASULGC). Tables 2 and 3 present an enrollment comparison by major degree area from 1980-1989 for member institutions.

Coulter (1985) credited the decline in enrollments to the "farm problem" image conveyed in newsprint, on the television and movie screens and heard on the radio. Mallory and Sommer (1986) conducted a survey, Student Images in Agriculture, resulting from a concern over declining enrollments in colleges of agriculture. Survey replies were collected from 540 high school juniors and seniors, equally distributed among urban, suburban and rural high schools. Representative student perceptions regarding agriculture included:

- Students associated a career in agriculture with farming.
- Students characterized a career in agriculture as hard work, dominated by males, blue-collar level work, boring, and insecure.
- Students ranked a stable and secure future as their top priority followed by an opportunity to earn a lot of money.
- Students rated agriculture lowest in terms of providing an opportunity to earn a lot of money. (pp.15-16)

Mallory and Sommer also reported many students admitted having a lack of knowledge about agriculture in general and a poor image of agriculture. Mallory and Sommer concluded that an agricultural college curriculum would adequately prepare the respondents for the types of careers they identified.

In 1988, the Farm Foundation requested the American College Testing (ACT) Program to conduct a survey to determine high school students' perceptions regarding college majors and careers and to determine what factors influence college choice. Again, the request was being made as a result of a concern regarding declining enrollments in colleges of agriculture.

Table 1. College of Agriculture Enrollment in NASULGC Institutions by Degree Level, Fall 1988 - 1989.

Program Area and Level	1988 Reported (N=73)	1988 Estimated Total/1/	1989 Reported (N=70)	1989 Estimated Total/1/	Percent Change (%)
Ag Sciences*					
Two Year	3,957	3,957	3,791	3,835	-3
Baccalaureate	57,375	57,375	57,165	57,823	+1
Freshmen	13,672	13,672	13,065	13,215	-3
Sophomore	11,865	11,865	12,341	12,483	+5
Junior	14,028	14,028	14,552	14,720	+5
Senior	17,040	17,040	16,590	16,781	-2
Other	770	770	617	624	-19
Masters	10,533	10,533	9,818	9,931	-6
Doctoral	9,451	9,451	8,663	8,763	-7
Other Programs					
Two Year	266	266	260	261	-2
Baccalaureate	9,087	9,087	9,729	9,777	+8
Freshmen	2,686	2,686	2,751	2,765	+3
Sophomore	1,812	1,812	2,127	2,137	+18
Junior	2,172	2,172	2,267	2,278	+5
Senior	2,313	2,313	2,343	2,355	+2
Other	104	104	241	242	+132
Masters	502	502	778	782	+56
Doctoral	63	63	94	94	+49
Total					
Two Year	4,155	4,155	4,051	4,096	-1
Baccalaureate	64,272	64,272	66,894	67,600	+5
Freshmen	15,728	15,728	15,816	15,980	+2
Sophomore	13,140	13,140	14,468	14,620	+11
Junior	15,691	15,691	16,819	16,998	+8
Senior	18,861	18,861	18,933	19,136	+1
Masters	10,823	10,823	10,596	10,713	-1
Doctoral	9,446	9,446	8,757	8,857	-6

/1/ Extrapolation based on most recent year's data reported by an institution.

*Ag Sciences is defined as general agriculture, animal sciences, plant sciences, soil sciences, agricultural business and management, education, communication, social sciences, natural resources, agricultural engineering and mechanization, food science, human nutrition, related biological and physiological sciences.

Source: Abridged Fall 1989 Enrollment at the Member Institutions of the National Association of State Universities and Land Grant Colleges (NASULGC). (1990, June).

Table 2. Historical Summary of Fall Enrollments in Colleges of Agriculture Classified by Program Area and Degree Level as Reported by NASULGC Institutions, 1980 - 1989.

Degree Level and Program Area	Enrollment Reported by Year /1/									
	1980 N = 63	1981 N = 71	1982 N = 73	1983 N = 67	1984 N = 75	1985 N = 74	1986 N = 69	1987 N = 66	1988 N = 73	1989 N = 70
Two Year Enrollment										
Agricultural Sciences*	3,711	5,245	4,029	4,275	3,170	3,177	3,993	3,599	3,957	3,791
Other Programs	344	1,284	656	455	110	60	149	922	266	260
SUBTOTAL	4,055	6,529	4,685	4,730	3,280	3,237	4,142	4,521	4,223	4,051
Baccalaureate Enrollment										
Agricultural Sciences	83,677	83,566	71,709	68,888	67,561	64,495	60,039	55,864	57,375	57,165
Other Programs	9,156	8,418	15,133	11,329	10,161	10,390	8,142	8,559	9,087	9,729
SUBTOTAL	92,833	91,984	86,842	80,217	77,722	74,885	68,181	64,423	66,462	66,894

/1/ Prior to 1982, data were collected from reports prepared by NASULGC, summarizing enrollment in the Colleges of Agriculture. Response to these early surveys was significantly lower than those initiated by the Food and Agricultural Education Information System (FAEIS), as seen in this table. Caution is advised in comparing data across different years since the combination of survey respondents from the population varies from year to year. Adjusted annual data are provided in Table Three for comparison purposes.

Note: N denotes actual number of survey respondents for the indicated year.

*Agricultural Sciences is defined as general agriculture, animal sciences, plant sciences, soil sciences, agricultural business and management, education, communication, social sciences, natural resources, agricultural engineering and mechanization, food science, human nutrition, related biological and physiological sciences.

Source: Abridged Fall 1989 Enrollment at the Member Institutions of the National Association of State Universities and Land Grant Colleges (NASULGC). (1990, June).

Table 3. Historical Summary of Fall Enrollments in Colleges of Agriculture Classified by Program Area and Degree Level (Adjusted to Reflect Nonreporting NASULGC Institutions), 1980 - 1989.

Degree Level and Program Area	Enrollment Reported by Year /1/									
	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
Two Year Enrollment										
Agricultural Sciences*	3,818	5,245	4,029	4,292	3,170	3,204	4,006	3,599	3,957	3,851
Other Programs	344	1,284	656	455	110	60	149	922	266	260
SUBTOTAL	4,162	6,529	4,685	4,747	3,280	3,264	4,155	4,521	4,223	4,111
Baccalaureate Enrollment										
Agricultural Sciences	85,236	83,566	71,729	71,330	70,418	64,585	60,622	56,086	57,375	57,823
Other Programs	9,701	8,418	15,133	11,329	10,161	10,427	8,237	8,559	9,087	9,777
SUBTOTAL	94,937	91,984	86,862	82,659	80,579	75,011	68,859	64,645	66,462	67,600

/1/ Adjusted data were calculated by applying the percent change by degree level indicated in Table One to responses from institutions which did not respond in any year since 1982. Adjusted data prior to 1982 were calculated in the same manner, except that responses pertaining to two year programs and "Other (non-agricultural)" programs were less complete. Caution is advised in comparing data across years on these two characteristics.

*Agricultural Sciences is defined as general agriculture, animal sciences, plant sciences, soil sciences, agricultural business and management, education, communication, social sciences, natural resources, agricultural engineering and mechanization, food science, human nutrition, related biological and physiological sciences.

Source: Abridged Fall 1989 Enrollment at the Member Institutions of the National Association of State Universities and Land Grant Colleges (NASULGC). (1990, June).

Two groups of ACT-tested high school students were randomly selected from the population of high school juniors and seniors who had taken the ACT during the 1987-88 academic year. Group one, when taking the ACT, indicated agriculture or a related area as a college major. Group two consisted of students who reported other areas of interest or who were undecided on a major.

Respondents were classified into three categories: agriculture students--students intending to major in agriculture while in college; non-agriculture students--students intending to major in areas other than agriculture; and changers--students who originally intended to major in agriculture, but who changed to a non-agriculture major. The following conclusions were drawn in the 1989 Farm Foundation report:

> The majority of students in the non-agriculture group had little awareness of careers in agriculture, postsecondary institutions offering agricultural curriculums and agricultural majors. What knowledge they did have came from media sources, particularly television. All three groups had preconceptions about agricultural majors and career paths. Intervention to change perceptions must be planned prior to the senior year of high school. (p. ii)

Coulter (1985) argued that today is still an exciting time to be a part of agriculture despite what the mass media has to say. She claimed there are challenging and rewarding career opportunities awaiting graduates with expertise in the areas of food, agriculture and natural resources. Stansbury and Coulter (1986) determined that relatively few youth have sufficient, accurate information regarding the wealth of career opportunities in and related to agriculture. Coulter advocated the education of American youth to the wealth of opportunities in and related to agriculture.

Gwynn (1990) charged colleges of agriculture to dispel the misconception that the agricultural industry is in a complete state of crisis. Gwynn asserted that educating teachers and counselors about the opportunities in agriculture is critical because many of them have cautioned students against attending agricultural colleges.

Stansbury and Coulter (1986) defined agriculture as a complex and challenging system with an almost limitless variety of career opportunities in natural resources, food and fiber products, science and technology, business, education and government. They advocated the need to educate the nation's best and brightest youth to the realization that scientific opportunities in agriculture are manifold as well as other areas of importance such as agricultural marketing and merchandising, agricultural engineering, and natural resource conservation and quality. Stansbury and Coulter also noted there is an inseparable connection of agriculture to the world of insurance, credit, stocks and commodities, real estate, tax laws and public policy.

Stansbury and Coulter claimed that agriculture stands alone in the wealth of opportunities it has to offer whether one specializes in biological or physical sciences, in business or finance, or in social science areas of agriculture. They asserted that agriculture affords dynamic, exciting, and rewarding career opportunities with both domestic and international dimensions.

Context of the Problem

Agriculture encompasses many disciplines, including engineering, plant and animal science, entomology, economics, environmental resource management, veterinary science, forestry and wildlife management. Today's agricultural practices are being revolutionized by biotechnology, genetic engineering and a global economy. Understanding the background of food, agriculture and natural resource sciences is central to our national program in food policy, nutrition education, conservation, community development and world marketing. The agricultural profession is in need of the talents of this country's best and brightest minds to meet the challenges, both old and new, of producing and delivering food and fiber to the world's consumers as well as to protect and preserve the nation's delicate national resources.

Previous efforts to attract youth into agriculture have included special programs which last in duration from one day to several weeks. Such programs have had a variety of purposes including a brief orientation to developing a more detailed knowledge base in agriculture. Funding for such efforts have included private support (Farm Bureau) and public support (National Science Foundation and USDA).

Currently the Pennsylvania Department of Education (PDE), the state's educational intermediate units (IUs) and Penn State are responding to the critical need for agricultural scientists. Together, they offer a five-week summer residence program for outstanding high school sophomores and juniors, including the handicapped, who have demonstrated exceptional ability in the sciences and who have a high interest in some phase of agriculture. This program was first offered in the summer of 1986 and was named the Pennsylvania Governor's School for Agriculture. The program was renamed the Pennsylvania Governor's School for the Agricultural Sciences (PGSAS) in 1988 (see Appendix A for Program Description).

PGSAS represents one of six Pennsylvania Governor's Schools of Excellence: Arts, Agricultural Sciences, Business, International Studies, Science and Teaching. The Pennsylvania Governor's Schools of Excellence challenge high school students who demonstrate appropriate talent, intellectual skill and leadership capabilities or potential.

Pennsylvania Governor's Schools were created in response to a Pennsylvania legislative mandate to address the needs of such exceptional students. By placing emphasis upon broad educational programs beyond those which local schools provide, Governor's Schools of Excellence stimulate, guide and motivate students to the greatest extent possible through intensive learning experiences. The Governor's Schools are designed to serve qualified students, including minorities, handicapped and male and female students from all geographic and ethnic backgrounds (Official Policy Manual, 1990, p. 7).

The six national goals for education agreed to by President Bush and the nation's governors have challenged educators to make all of American schools centers for achievement by the end of the decade. Goal number two seeks to reduce the national dropout rate and increase the high school graduation rate to at least 90 percent by the year 2000. Goal number three endeavors by the year 2000, that American students will leave grades 4, 8, and 12 having demonstrated competency in challenging subject matter, including English, mathematics, science, history and geography (Phi Delta Kappan, 1990).

Educational and leadership activities of the Pennsylvania Governor's School for the Agricultural Sciences focus on the science, technology, and domestic/international policy of food, agriculture and natural resources. Through a wide range of unique learning activities, students gain a greater appreciation and awareness of the career opportunities in the agricultural sciences and an understanding of the essential role agriculture plays in the local, national and global economies.

The Pennsylvania Department of Education and the College of Agriculture at Penn State University established the following goals for the Pennsylvania Governor's School for the Agricultural Sciences:

1. To acquaint high school age youth with the scientific and professional opportunities in food, agriculture, and the renewable natural resources.
2. To provide educational programs in agriculture to exceptional high school age youth who would not otherwise have access to such programming.
3. To challenge these youth to use their intellect in studying and researching the scientific nature of agriculture. (Annual Report, 1990, p. 2)

The fourth national goal for education adopted by President Bush and the nation's governors proposed by the year 2000, U.S. students will be first in the world in mathematics and science achievement (Phi Delta Kappan, 1990). The Pennsylvania Governor's Schools of Excellence foster student development and achievement toward this goal.

Objectives of the Pennsylvania Governor's School for the Agricultural Sciences outlined by the Pennsylvania Department of Education and the College of Agriculture at Penn State University are as follows:

1. To provide an academically talented group of students with courses, field trips, guest lectures, and other activities to expand their knowledge of food, agriculture, and the natural resources.

2. To provide PGSAS participants with an opportunity to explore scientific concepts, use sophisticated laboratory facilities, and interact with professional scientists.

3. To provide hands-on experience in new technologies and research techniques available in the agricultural sciences.

4. To inform the PGSAS participants of the array of interesting and rewarding careers available in the agricultural sciences.

5. To encourage PGSAS students to develop leadership, communication, problem solving, and interpersonal skills, and to apply these skills upon returning to their home districts. (Annual Report, 1990, p. 2)

Similar programs organized and funded as Governor's Schools are found throughout the United States. The first governor's school was started in North Carolina in 1966. Since then, 64 schools have been developed, funded, and implemented in 32 states (Hallowell, 1990).

The Pennsylvania Governor's School for the Agricultural Sciences was created in 1986 partially as a result of a sincere concern over declining enrollments in colleges of agriculture across the United States including Penn State University. The Governor's School for the Agricultural Sciences has been offered for five consecutive summers since its inception in 1986. This was an appropriate time to examine to what extent the program objectives have been met. This research should serve as an effective tool in future program planning and implementation of the Pennsylvania Governor's School for the Agricultural Sciences.

Purpose and Objectives of the Study

The primary purpose of this study was to determine if the Pennsylvania Governor's School for the Agricultural Sciences was meeting the first four objectives established by the Pennsylvania Department of Education and the College of Agriculture at Penn State University. The specific objectives of the study were:

1. To determine if the Pennsylvania Governor's School for the Agricultural Sciences provided program participants with experiences and information which expanded their knowledge of educational opportunities related to food, agriculture and natural resources.
2. To determine if the Pennsylvania Governor's School for the Agricultural Sciences provided program participants with experiences and information which expanded their knowledge of career opportunities related to food, agriculture and natural resources.
3. To determine if the Pennsylvania Governor's School for the Agricultural Sciences provided program participants with an opportunity to explore scientific concepts, interact with professional scientists and to use research techniques available in the agricultural sciences.

Limitations of the Study

The information collected represents self-reported perceptions and information for PGSAS participants. The fact that they were requested to recall information from several years ago raises the question of how accurate their recall was.

Organization of Thesis

The thesis is organized into five chapters. Chapter 1 provides a brief overview of the scope of the agricultural industry, employment opportunities in or related to food, agriculture and natural resources, enrollment trends in colleges of agriculture, context of the problem, purpose and objectives of the study and limitations of the study.

Chapter 2 reviews the literature relating to career development, programs for gifted students, factors associated with career choice, and evaluation of educational programs.

Chapter 3 describes the clarification of purpose, objectives of the study, general design, population and sample, instrumentation, data collection procedures and data analysis.

Chapter 4 presents the results of the data analysis and findings of the study.

Chapter 5 presents the summary, conclusions and recommendations for future research.

Chapter 2

REVIEW OF LITERATURE

Introduction

The emphasis in this study was to determine if the Pennsylvania Governor's School for the Agricultural Sciences (PGSAS) provided the program participants with experiences and information which expanded their knowledge of educational and career opportunities related to food, agriculture and natural resources. In addition, this study sought to determine if the Governor's School experience provided program participants with an opportunity to explore scientific concepts, interact with professional scientists and to use research techniques available in the agricultural sciences. The review of literature is presented in the major sections of career development, programs for gifted students, factors associated with career choice and evaluation of educational programs.

Career Development

Lack of Adequate Career Information

Burck (1984) stated that "today Americans are living in one of the most complex, affluent, technocratic, and turbulent societies ever known; a society that is undergoing rapid change among all of its institutions, e.g. work, religion, marriage/mate/family, economic, etc." (p. 11). Venn (1971) wrote that our nation and Western civilization in general has changed drastically in terms of science and technology as applied to the agricultural, industrial and commercial institutions of the nation. According to Venn, this in effect has caused a revolution in the social, economic and educational operations of the country.

Burck contended that people have found themselves in a perplexing situation in terms of occupational choice because of the revolutionary changes taking place in society.

Burck also contended that people are confronted with a seemingly ever-increasing assortment of career possibilities from which to choose, yet find very little available information on which to base a career choice.

According to Burck (1984), counselors in the schools today are faced with a myriad of other activities they feel take priority over career counseling: drug abuse, human relationships, outreach programs and routine administrative duties to name a few. Burck contended these tasks to be essential but concluded in reality leave very little if any time for career counseling/development.

If the United States is to remain competitive, Burck claimed and in the forefront of advances in technology, then we cannot afford to overlook this lack of career development in the secondary school systems. Burck also wrote that as a nation we need to develop innovative, creative, competitive, and need fulfilling services and products, both quickly and efficiently as well as prepare a work force that is flexible, assertive and creative.

Burck viewed early intervention as key in developing the future leaders of our nation. Jordaan and Heyde (1979) claimed that:

> The vocational possibilities young people are aware of and prepared to consider, their readiness to choose among them, and the determinants and outcomes of their aspirations and choices are, therefore, matters of considerable importance to educators and counselors, particularly since evidence is mounting that adolescent goals, even in the last year of high school, are often poorly conceived and at variance with later work histories. (p. 2)

Jordaan and Heyde defined occupation as the primary source of social status in our society, and also as a critical means of gratifying self interests, abilities and values. They established work as central to most peoples' lives. Jordaan and Heyde contended that people today, whether classified as adolescents or adults, seem to know little about themselves; feelings and fears; their prejudices or preferences; or strengths and their weaknesses.

Burck (1984) claimed that people want answers to these questions so as to sort through their personal characteristics in order to make wise career decisions. Burck acknowledged that career planning and development have not always been so complicated, but neither has been our nation's industry and society. Burck wrote that one of the most important tasks challenging our educational system is to assist people to prepare themselves for the future.

Toward a Theory of Vocational Choice

Super (1990) identified people from four disciplines as the pioneers of career development. They are: the differential psychologists interested in work and occupation; the developmental psychologists concerned with the course of life; the sociologists focusing on occupational mobility as a function of socioeconomic class; and the personality theorists who consider individuals as organizers of experience. Super described contributions from the above four disciplines as follows:

DIFFERENTIAL PSYCHOLOGY. Differential psychology developed and utilized intelligence and aptitude tests.

DEVELOPMENTAL PSYCHOLOGY. Developmental psychology provided an understanding into the development of abilities, interests, values, and the interaction between individual and environment.

OCCUPATIONAL SOCIOLOGY. Occupational sociology provided insight into the importance of environmental influences on occupations.

PERSONALITY THEORY. Personality theory provided insight into how people become what they are, how they change, and how they make decisions.

Super (1971) stated that "an adequate theory of vocational choice would investigate and analyze results of previous research, would consider the development of personal

preferences and of the differences in the stages, choices, entry, and adjustment; and also define the process through which interest, capacities, values, and opportunities are formed" (p. 115). Super defined the following key elements of such a theory of vocational development based on the literature identified above:

INDIVIDUAL DIFFERENCES. One of the basic elements of a theory and a cornerstone of modern educational and vocational psychology.

MULTIPOTENTIALITY. Each individual person has the potential for satisfaction and success in a number of occupations.

OCCUPATIONAL ABILITY PATTERNS. Abilities and interests fall into patterns which distinguish one occupation from another. People have been known to prefer, enter, remain, like and succeed most consistently in occupations for which they have appropriate patterns of traits.

IDENTIFICATION AND THE ROLE OF MODELS. Recent research has provided some objective basis for the theory that childhood and adolescent identifications play a part in shaping vocational interests, and also provide role models which facilitate the development and implementation of a self-concept, provided that the required abilities and opportunities are present.

CONTINUITY OF ADJUSTMENT. This represents the cement of the various elements which need to be brought together in a theory of vocational development and as an explanation of the process of compromise between self and reality.

LIFE STAGES. Related to the work of psychologists and sociologists, it describes the stages through which growth and development proceed and how such stages bear on the process of vocational choice and adjustment.

CAREER PATTERNS. Career pattern theory is key to the theoretical basis for vocational guidance, it gives the counselor basic assumptions concerning the social, educational, and occupational mobility of counselors, and also enables the

counselor to foresee types of problems and/or concerns which a given client is likely to encounter in establishing a career.

DEVELOPMENT CAN BE GUIDED. The development of an individual can be aided and guided by the provision of adequate opportunities for the utilization of aptitudes and for the development of interests and personality traits.

DEVELOPMENT THE RESULT OF INTERACTION. The nature of the interaction between the individual and the environment is complex and impacts a great deal on the degree of sophistication in the use of guidance techniques.

DYNAMICS OF CAREER PATTERNS. This represents the interaction of the individual and the environment during the growth, exploratory, establishment and maintenance stages in relationship to a career pattern that is typical or atypical of their parental socioeconomic group.

JOB SATISFACTION: INDIVIDUAL DIFFERENCES, STATUS, AND ROLE. Vocational development is the development of a self-concept; the process of vocational adjustment is the process of implementing a self-concept; and the degree of satisfaction attained is proportionate to the degree to which the self-concepts has been implemented.

WORK IS A WAY OF LIFE. The theory that adequate vocational and personal adjustment are more likely to result when both the nature of the work itself and the way of life that goes with it are congenial to the aptitudes, interests, and values of the person in question. This is viewed by many as the basic element in a theory of vocational development.

Based on the above elements of a theory of vocational development, Super (1990) organized his career development theory into the following 14 propositions:

1. People differ in their abilities and personalities, needs, values, interests, traits, and self-concepts.

2. People are qualified, by virtue of these characteristics, each for a number of occupations.

3. Each occupation requires a characteristic pattern of abilities and personality traits, with tolerances wide enough to allow both some variety of occupations for each individual and some variety of individuals in each occupation.

4. Vocational preferences and competencies, the situations in which people live and work, and, hence, their self-concepts change with time and experience, although self-concepts, as products of social learning, are increasingly stable from late adolescence until late maturity, providing some continuity in choice and adjustment.

5. This process of change may be summed up in a series of *life stages* (a "maxicycle") characterized as a sequence of *growth*, *exploration*, *establishment*, *maintenance*, and *decline*, and these stages may in turn be subdivided into (a) the fantasy, tentative, and realistic phases of the *exploratory stage* and (b) the trial and stable phases of the *establishment stage*. A small (mini) cycle takes place in transitions from one stage to the next or each time an individual is destabilized by a reduction in force, changes in type of manpower needs, illness or injury, or other socioeconomic or personal events. Such unstable or multiple-trial careers involve new growth, re-exploration, and reestablishment (recycling).

6. The nature of the *career pattern* -- that is, the occupational level attained and the sequence, frequency, and duration of trial and stable jobs -- is determined by the individual's parental socioeconomic level, mental ability, education, skills, personality characteristics (needs, values, interests traits, and self-concepts), and *career maturity* and by the opportunities to which he or she is exposed.

7. Success in coping with the demands of the environment and of the organism in that context at any given life-career stage depends on the readiness of the individual to cope with these demands (that is, on his or her *career maturity*). *Career maturity* is a constellation of physical, psychological, and social characteristics; psychologically, it is both cognitive and effective. It includes the degree of success in coping with the demands of earlier stages and substages of career development, and especially with the most recent.

8. *Career maturity* is a hypothetical construct. Its operational definition is perhaps as difficult to formulate as is that of intelligence, but its history is much briefer and its achievements even less definitive. Contrary to the impressions created by some writers, it does not increase monotonically, and it is not a unitary trait.

9. Development through the *life stages* can be guided, partly by facilitating the maturing of abilities and interests and partly by aiding in reality testing and in the development of self-concepts.

10. The process of career development is essentially that of developing and implementing *occupational self-concepts*. It is a synthesizing and

compromising process in which the self-concept is a product of the interaction of inherited aptitudes, physical makeup, opportunity to observe and play various roles, and evaluations of the extent to which the results of role playing meet with the approval of superiors and fellows (interactive learning).

11. The process of synthesis of or compromise between individual and social factors, between self-concepts and reality, is one of role playing and of learning from feedback, whether the role is played in fantasy, in the counseling interview, or in such real-life activities as classes, clubs, part-time work, and entry jobs.

12. Work satisfactions and life satisfactions depend on the extent to which the individual finds adequate outlets for abilities, needs, values, interests, personality traits, and self-concepts. They depend on establishment in a type of work, a work situation, and a way of life in which one can play the kind of role that growth and exploratory experiences have led one to consider congenial and appropriate.

13. The degree of satisfaction people attain from work is proportional to the degree to which they have been able to implement self-concepts.

14. Work and occupation provide a focus for personality organization for most men and women, although for some persons this focus is peripheral, incidental, or even non-existent. Then other foci, such as leisure activities and homemaking, may be central. (Social traditions, such as sex-role stereotyping and modeling, racial and ethnic biases, and the opportunity structure, as well as individual differences, are important determinants of preferences for such roles as worker, student, leisurite, homemaker, and citizen.) (pp. 207-208)

Vocational Life Stages

Super's (1957) theory of career development is built upon the framework of life stages that are based on the premise that vocational tasks reflect larger life tasks. Super's theory is based in the psychology of careers which stems from developmental psychology and rests on the assumption that career development parallels human development and is evolutionary in nature (Osipow, 1973). Super and Bohn (1970) identified five vocational life stages:

Growth Stage. *Growth* occurs between birth - 14 years of age and is characterized by multiple experiences. Self-concept develops through identification with key

figures in family and in school. Needs and fantasy are dominant early in this stage with interest and capacity becoming more important with increasing social participation and reality testing. Substages of the growth stage are:

> FANTASY (4-10). Needs are dominant; fantasy role playing.
>
> INTERESTS (11-12). Likes are the major determinant of aspirations and activities.
>
> CAPACITY (13-14). Abilities are given more consideration and job requirements are considered including training. (p. 136)

Exploration Stage. Exploration occurs between 15-24 years of age and is characterized by the need to make career decisions. Self examination, role tryouts and occupational exploration take place in school, leisure activities and part-time work. Substages of the *exploration stage* are:

> TENTATIVE (15-17). Needs, interests, capacities, values and opportunities are all considered. Tentative choices are made and tried out in fantasy, discussion, courses, work, etc.
>
> TRANSITION (18-21). Reality considerations are given more weight as the youth enters labor market or professional training and attempts to implement a self-concept.
>
> TRIAL (22-24). A seemingly appropriate field having been located, a beginning job in it is found and is tried out as a life work. (p. 136)

Establishment Stage. Establishment occurs between 25-44 years of age and is characterized by achieving competence in an occupation through experience/ training. There may be some trail early in this stage, with consequent shifting, but establishment may begin without trial, especially in the professions. Substages of the *establishment stage* are:

> TRIAL (25-30). The field of work presumed to be suitable may prove unsatisfactory, resulting in one or two changes before the life work is found or before it becomes clear that the lifework will be a succession of unrelated jobs.
>
> STABILIZATION (31-44). As the career pattern becomes clear, effort is put forth to stabilize, to make a secure place, in the work world. These are creative years for most persons. (pp. 136-137)

Maintenance Stage. *Maintenance* occurs between 45-64 years of age and is characterized by inservice and continual training to preserve skills and developing retirement resources/plans. Little new ground is broken in this stage, but there is continuation along established lines.

Decline State. *Decline* occurs at the age of 65+ and is characterized by adaptation to physical ability/capacity. New roles must be developed, first that of selective participants and then that of observer rather than participant. Substages in this stage are:

> DECELERATION (65-70). Sometimes at the time of official retirement, sometimes late in the maintenance stage, the pace of work slackens, duties are shifted, or the nature of the work is changed to such declining capacities. Many men find part-time jobs to replace their full-time occupations.
>
> RETIREMENT (71 on). As with all the specified age limits, there are great variations from person to person. But complete cessation of occupation come for all in due course, to some easily and pleasantly, to others with difficulty and disappointment, and to some only with death. (p. 137)

During the *exploration stage*, individuals between 15-24 years of age recognize and accept the need to make career decisions and to obtain the necessary information that is relevant. During *exploration* the individual becomes aware of their interests and abilities and how they can relate them to career opportunities. It is during the *exploration stage* that the individual identifies possible career paths and the level of work consistent with their abilities and interests. Training to develop skills is acquired during this stage fulfilling the individual's interests and abilities (Super, 1957).

Super (1957) referred to school as the formal adolescent exploratory institution. Super credited education as the vehicle to assist individuals to emerge in the adult world as an effectively functioning adult. Super identified the curricula of the early years in high school and in college as exploratory in content and purpose. Orientation courses in the first year or two of each level of education beginning in junior high school is another example identified by Super.

Super contended many students need a great deal of orientation to themselves and their prospective fields of work. Super advocated orientation to prospective fields could be accomplished in lectures, field trips, films, reading, and discussions, and extracurricular activities in schools and colleges. He claimed clubs make possible orientation to and try-outs in agriculture, science, liberal arts, and other fields of work avocationally without formal commitment. Additional examples cited by Super are assembly programs to emphasize career opportunities and requirements, group projects, and home and community projects.

Super (1957) also described informal situations as a means of exploration of the self and one's role in the world of work. Super identified social groups, friendships, role models in school and the community as examples of informal exploration.

Career exploration also occurs in the realm of part-time work (Super, 1957). According to Super, part-time and vacation work can have important exploration values. He contended part-time work provides youth with an opportunity to develop mature work habits such as regularity, punctuality, responsibility and meeting deadlines. Super reported this was a way for youth to try out adult roles. He claimed that part-time work provides an individual with opportunities to test aptitude, interests and skills to find out if this is a career possibility. Super acknowledged the part-time work experience can also be augmented by reading materials, interviews with professionals, and discussion with fellow workers and counselors.

Career Options of Youth

Super and Bohn (1970) established most high school youth who complete high school face a choice of three alternatives: higher education, the military or the labor market. Figure 1 represents Super and Bohn's vocational orientations of higher education.

In regard to higher education, Super and Bohn defined two primary orientations for a person's vocational development: these are *exploration* and *preparation*. *Exploration* has three variations. First, *exploration* gives the student the opportunity to keep their program flexible and broad (classic liberal education). Second, *exploration* is that of *finding focus* that is *non occupational* in nature. Students have the opportunity to determine those areas most important to them. Third, there is *finding focus* that is *occupational* in nature. After engaging in a general curriculum, a student usually chooses a major, which then leads to career choice.

Super and Bohn (1970) wrote that higher education for students who have made tentative decisions regarding their future careers is more likely to be a setting that emphasizes preparation either through *crystallization* or *specification*. In *crystallization*, general vocational goals already decided are brought into sharper focus by exposure to material in the area of interest. *Specification* is the preparation for students whose vocational decision is a fairly discrete vocational decision. *Specification* is most appropriate when basic interests of self-identify have been settled.

Super and Bohn reported there is a large number of individuals who need special assistance with career decisions. These people constitute special groups by virtue of inherited characteristics, accidents, and environment. Included in the group are the intellectually gifted, the retarded, the physically handicapped, the emotionally disturbed, women, and various ethnic and religious groups.

Super and Bohn claimed the public school system is unable to tailor the educational process to fit each student. Therefore, Super and Bohn advocated those with special and outstanding talents need special educational opportunities to maximize their development potential. Super and Bohn concluded the gifted require an approach somewhat different from that appropriate for others.

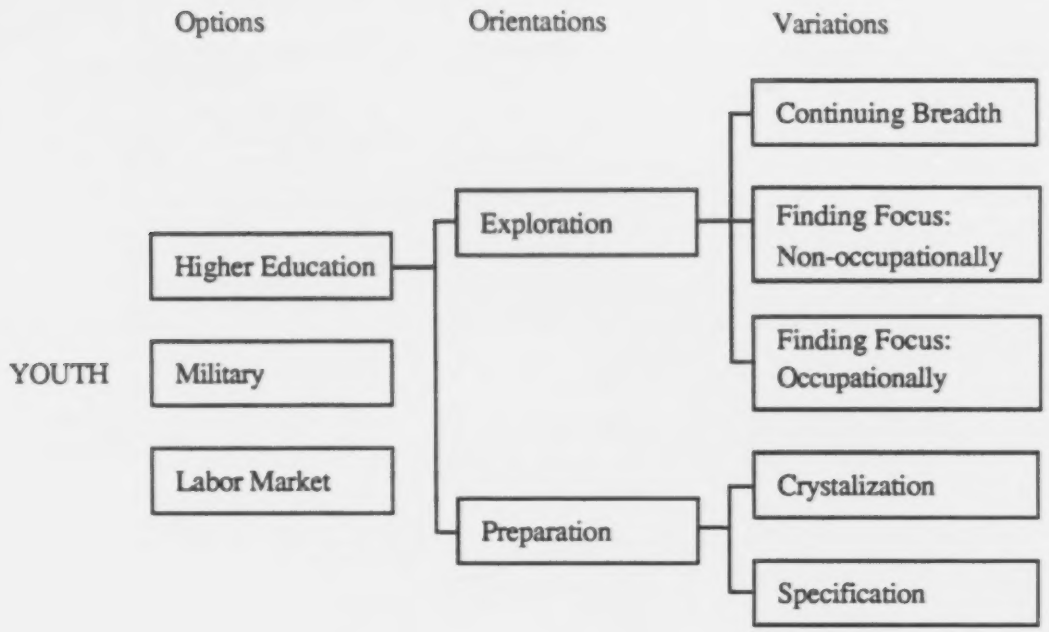

Figure 1. Vocational Orientations of Higher Education

Source: D.E. Super and M.J. Bohn, Jr., (1970), p. 183.

Programs for Gifted Students

Career Guidance for Gifted Students

Silverman (1989) wrote that not all gifted individuals decide upon a career in either high school or college. In fact, she acknowledged these individuals may not find their calling until midlife. Silverman claimed gifted adults often move from position to position within a profession or embark upon several careers.

Silverman claimed gifted students need extra time to make their career choices. She advocated gifted students need a broad educational base to allow them to move in several different directions. She noted an effective career guidance tool is providing gifted students

with real life experiences in some of their avenues of interest through internships, mentorships, work-study or community based service.

Herr (1976) wrote that gifted and talented students do not constitute a homogeneous group in regard to their intellectual capability, their creativity, or their artistic and psychomotor skills. He claimed gifted students may be multi-potential in their capability to do a wide range of tasks in a superior fashion; others, however, may be talented in a clearly defined activity. Herr advocated career education must respond to all of these conditions.

Herr declared career education within the confines of formal institutionalized schooling is likely to be inadequate. He noted gifted students benefit by working with persons who are achieved professionals in the arts, sciences or humanities. Herr stated "gifted and talented youth seem to manifest a need for testing the reality of different career possibilities through actual performance, experimentation, or other direct involvement with these foci" (p. 103).

Silverman (1989) noted that gifted girls have a unique set of challenges to deal with. Gifted and talented females need to determine how to juggle both a family and a career, and to decide if they wish to do so. Silverman claimed gifted girls need encouragement to explore career possibilities that traditionally have been for males only. Fox (1981) wrote that exposure to role models is essential for gifted females. He claimed gifted girls need to be exposed to woman role models who successfully combine a career, marriage, and raising children. In addition, Silverman advocated gifted girls need to meet women who choose marriage, career, and no children as well as women who have decided not to marry.

Educational Needs of Gifted Students

Gustin (1984) acknowledged numbers of students in the schools possess specialized talents and extraordinary learning abilities to such a degree their needs cannot be

met completely in a typical school program. Feldhusen and Sokol (1982) contended gifted youth need a variety of enriched and accelerated educational experiences to stimulate their development toward high level achievement in adulthood. They claimed gifted, creative, and talented students have special educational needs.

Feldhusen and Sokol organized special needs of gifted and talented students into the following three broad categories:

> COGNITIVE. The cognitive needs of the gifted include opportunities to develop basic thinking skills earlier than average ability students, to acquire a broader store of knowledge, to engage in disciplined and in-depth inquiry, to deal with broad-based theories, and interdisciplinary problems, to learn methods of research and analysis at an early age, and to exercise self-direction in learning. Fundamentally, gifted students need to learn more, more rapidly, at higher levels, to greater depths of inquiry, and with more attention to organizational theories or ideas.
>
> AFFECTIVE-SOCIAL. Gifted students need to acquire motivation through the stimulation of association with intellectual or artistic peers and through identification with adult models of creatively successful individuals. The gifted must come to see themselves as possessing superior ability or talent and not as strange or peculiar. Association with precocious peers can provide a sense of normalcy and acceptability for the gifted. The development of appropriate self-concept is also dependent on the nature of a child's achievement and cognitive experience. For the gifted this means there must be accelerated and higher-level thinking experiences, opportunities for inquiry in great depth, and successes in challenging learning situations.
>
> GENERATIVE. The generative needs of the gifted grow out of their inevitable ultimate roles as creative producers of new ideas, new systems, and new products. Average and low ability youth will at best be receivers of the knowledge and skills produced in their time and culture. The gifted and talented will master that knowledge and those skills, and go beyond to create anew. That experience and sense of creating, of seeking new approaches, of identifying and solving problems, of inquiring in-depth for new interpretation can and must result not only form high level cognitive learning but also from early and continuous experience in research, independent investigation, inquiry, and creative activity. Out of such activity the gifted individual develops appropriate cognitive skills, new understandings, habits or motivation, and a self-concept which sees self as able to produce and create. (pp. 51-52)

Feldhusen and Sokol concluded developers of extra-school programs for the gifted, talented, and high ability youth should consider all three areas of need when planning courses and instructional activities for these youth.

Benefits of Summer Programs

Olszewski-Kubilius (1989) wrote that well-developed summer programs for gifted and talented adolescents do a good job of meeting intellectual and social needs of these students. Olszewski-Kubilius claimed summer programs can result in increased confidence, a strong desire to seek out challenging coursework and long-term friendships.

Olszewski-Kubilius identified numerous benefits of summer programs. According to Olszewski-Kubilius summer programs provide students an opportunity to participate in *challenging course work* that is commensurate in level and pace with a student's abilities and intellectual level. Summer programs afford gifted and talented students an opportunity to test themselves and their limits in a demanding intellectual situation.

Olszewski-Kubilius claimed *intellectual* and *social peer interaction* as benefits of summer programs for academically talented students. Summer programs can provide these students with a *"true"* peer group both in and out of the classroom that helps to eliminate their fears of being unusual or different from agemates.

Olszewski-Kubilius wrote that residential programs provide gifted students with the opportunity to learn *independent living skills*. She wrote that in these settings, academically talented students may be more willing to take *risks*, both intellectual and social. Summer programs encourage students to be more creative in their work and more confident in their social interactions.

Social networking, college exposure, and *educational opportunities* were additional benefits cited by Olszewski-Kubilius. Attending programs on college campuses can expose students to college life--its rigor, intensity, and breadth of opportunity. Olszewski-

Kubilius claimed these can be especially revealing experiences, particularly for students from rural areas and small towns. Lastly, Olszewski-Kubilius identified *insight into self*, as individuals and as members of peer groups, as a benefit of residential summer programs.

Stanley (1989) stated "residential academic courses taken during summers have values far beyond the subject matter learned" (p. 197). Stanley contended these programs offer stimulating chances for the gifted and talented to mingle with large numbers of intellectual peers and also with intellectual superiors. He wrote that this association with such persons, which is probably the first, fosters gifted and talented students to develop a better self-concept and improve their coping skills.

Factors Associated with Career Choice

Determinants of Career Patterns

Super and Bohn (1970) suggested careers and career patterns are affected by a variety of economic, social, and psychological determinants. Table 4 depicts Super and Bohn's major determinants of career patterns. Super and Bohn indicated socioeconomic status, race and sex makes entry into educational and occupational positions easier or more difficult. Super and Bohn suggested the greater one's resources, the more informed people one can acquire information from, the fewer and lower the barriers of discrimination, and the less one is handicapped by domestic responsibilities and by traditional barriers (certain roles), and the greater the mobility of the individual, then the more freedom one has to use their abilities and to develop their interests.

Roe and Lunneborg (1990) cited race, sex, and the social and economic position of the family as important factors of career choice in determining how far various inherited characteristics may be developed within an individual. Super and Bohn (1970) also

Table 4. Major Determinants of Career Patterns.

Psychological Determinants	Economic and General Determinants
Intelligence	Business Cycles
Special Aptitudes	Economic Booms and Depressions
Interests	Fads
Values	Technological Change
Needs	War
Social Determinants	Natural Disasters
Socioeconomic status	
Education	
Family Situation	
Military Service Obligation	
Citizenship	
Race	
Religion	
Sex	

Source: D.E. Super and M.J. Bohn, Jr., (1970), p. 145.

indicated intelligence, special aptitudes, interests, values and needs affect occupational choice, success, stability and satisfaction because career development is a series of occupational choices and adjustments made in the course of a person's lifetime. Holland (1985) identified intelligence, gender and social class as important influences on how stability and change occur in career pathways.

Super and Bohn wrote that interests, values, and special aptitudes guide people into certain channels rather than into others. They noted motivation determines how high a person aspires and how hard they work at acting upon their decisions.

Super and Bohn cited external factors such as business trends, economic instability, fads, technology, war, and natural disasters which are beyond the control of individuals, as major determinants of career patterns. Super and Bohn concluded internal factors such as intelligence, education, and motivation to use good information well enable individuals to make wise career decisions that maximize career stability and minimize loss due to natural cause.

The Farm Foundation (1989) found in their study, Student Images of Agriculture, the following key persons, materials and or events that influence high school students in their pursuit of a particular higher education curriculum or career goal.

> •Persons in the profession of interest exerted the strongest influence on choice of college major and choice of career. Fathers, high school teachers, and mothers were second, third, and fourth, respectively, in their influence.
>
> •Newspapers/magazines had some influence on choice of major and choice of career.
>
> •Personal interests and personal happiness were the most important factors in choosing a college major and a career.
>
> •More students made their current college major and career choices during the junior year of high school. (p. 2)

Blau, Gustad, Jessor, Parnes, and Wilcock (1971) identified eight factors, four pertaining to occupations and four characterizing individuals, as determinants of occupational entry. The following section briefly describe each category:

Occupation Attributes

1. Demand for new members in the occupation indicated by the number of vacancies that exist at any one time.
2. Technical qualifications needed for optimum performance of occupational tasks.
3. Criteria for selection that are not relevant to actual performance (ie. veteran status, looks, religion).
4. Personal and financial rewards

Individual Attributes

1. Knowledge about the requirements for entry, the rewards offered, and the opportunities for employment and advancement.
2. Technical skills.
3. Social characteristics.

4. Individual value orientation.

Blau et al. also cited the individual's knowledge, ability, education, social position and relationships, and orientation toward occupational life as other characteristics which influence career decisions.

Career by Choice

Super and Bohn (1970) contend in their model of major determinants of career patterns that internal and external determinants interact to produce an individual's career decision. Super and Bohn stated "the crucial question in career development is how internal and external determinants are synthesized to produce a decision" (p. 146). Super and Bohn outlined three theories of the *choosing person* in terms of career development:

> ACCIDENT THEORY. The *accident theory* states that vocational development and occupational choice are largely accidents. In this theory the term *accident* denotes events or conditions beyond the control of the individual. (p. 146)
>
> SELF-CONCEPT THEORY. A *self-concept* theory of vocational development recognizes the importance of the formation of self-concepts, of their translation into occupational terms, and of their implementation as one becomes established in an appropriate occupation. (p. 147)
>
> ROLE THEORY. *Role theory* makes an explicit attempt to take into account the external determinants of the occupational concepts that people hold. A role is a set of expectations that society, or some identifiable group in that society, has of people occupying a position. (p. 150)

Super and Bohn (1970) conceded social class, family context and the sphere of activity that open and close opportunities to the individual are important and potent determinants of career choice. However, they claimed motivation plays a part in career choice and development regardless of any one social class. Therefore, Super and Bohn recommended the synthesizing role of the individual be explored in order to allow for a comparison of alternatives and a weighing of factors and conditions of a choosing person.

Super and Bohn (1970) stated "if the whole life-span of an individual needs is considered, a series of self-concept modification and adjustment processes that follow in

maturity are also important" (pp. 147-148). Super and Bohn suggested the following processes in the *Self-Concept Theory*:

FORMATION PROCESS. The *formation process* is one of exploration of one's self and their environment. This process includes differentiation of the self from others, identification with others who can serve as role models and playing selected social roles with a more or less conscious evaluation of the results. Super and Bohn refer to this as reality testing.

TRANSLATION OF SELF-CONCEPTS. The *translation of self concepts* into occupational terms takes place through one or more of three processes: *identification*, *experience*, and *observation*. *Identification* with an adult role model involves a translation in which one says "I am like him" or I want to be like him", without considering their specific traits or abilities. *Role experience* provides many people with opportunity for the discovery of unsuspected vocational aspects of the self-concept. Through *observation*, reading, and hearing things, an individual learns that some of their aptitudes and interests are important in certain occupations.

IMPLEMENTATION PROCESS. The *implementation process* is one of action. The individual seeks and obtains the specialized education or training needed for the occupation to which they aspire, and/or seeks and finds employment in it. Finding it the individual consolidates his concept of themes as worker.

MODIFICATION. *Modification* takes place after entry and establishment in an occupation.

PRESERVATION. The *preservation* of the self-concept characterizes the maintenance stage. The established person seeks to hold their own despite occupational change or the lessening of personal drive and energy. Further adjustment is necessary during the years of decline as capacities and role expectations change more drastically.

Super and Bohn (1970) acknowledged the adequacy of the translation of self-concepts into occupational terms has been studied by individuals, who hypothesize the similarity of self-concepts and occupational concepts is greater for occupations in which an individual has expressed an interest than for those in which the individual has shown little interest.

According to Super and Bohn, cognitive dissonance theory postulates individuals change their perspectives of the external world to keep their self-concepts intact. Super and Bohn concluded that occupational perceptions are determined more by external factors and conditions than by personal characteristics. Therefore, in a situation requiring a choice, they claimed agreement of self and occupational concepts do not appear to determine vocational choice and adjustment.

Choice of Higher Education Institution

The choice of the institution is somewhat reflected in the career choice of an individual. Erdmann (1983) found the availability of specific academic programs to be the single most important factor to students in the college selection process. Erdmann also found the reputation of a particular institution (in the mind of the students), institution location and size all to be powerful forces in the selection process.

Douglas, Powers and Choroszy (1983) examined the reasons why academically talented high school seniors select institutions of higher education. They found academic quality of the institution, special features of the institution, social aspects of the institution and socioeconomic reasons to be the four strongest factors influencing their choice of institution.

Douglas and Powers (1985) later identified the following factors as important influences on high school students' choice of higher education institutions: quality of

course instruction, professional competence of professors, overall training, intellectual stimulation as a result of training, superior program in one's preferred major, and opportunity for professor-student interaction in courses. Douglas and Powers determined the following factors have the least amount of influence on high school students' choice of a higher education institution: parents attended school there, possibility of commuting daily, parents felt it was the best choice, friends will attend the institution, teacher or counselor recommended it, and to earn more money. Douglas and Powers concluded there were four strong factors (in order of importance) influencing student choices of higher education institutions: Factor I: Academic quality of the institution (intellectual stimulation and quality instruction); Factor II: Social aspects of the institution; Factor III: Special institutional features (emphasis on grades; parents felt it was the best choice); and Factor IV: Financial considerations.

Lester and Graham (1990) identified the following six factors in the literature as influences of college enrollment: background, parents, adults other than parents, personal and career goals, recruitment procedures and the institution itself. However, they found conflicting results after conducting a recent study with high ability students who attended a summer educational experience for agriculture and home economics. Lester and Graham found the summer educational experience, adults other than parents and rural background to influence career choice with the summer experience having the most significant influence.

Bugaj (1990) identified 19 variables effecting college choice. The top five variables in order of importance were: courses in chosen field; chance of getting job after graduation; campus visit; respect given students by others; and number of courses offered. Prestige of the campus ranked eighth and parental advice ranked ninth. The least important factor found by Bugaj was the advice of family members who did not attend the college at which the subjects would matriculate.

Evaluation of Educational Programs

Models for Evaluation

Dubravcic, Chinien and Pratzner (1986) outlined seven evaluation models of that might be useful in assessing educational programs. All the models are based upon different methodologies and different assumptions of what is fact, known and knowable. Each model has a different target audience. The models are similar in that each model presents a way of systematically assessing the merits or worth of educational programs. The following sections briefly describe each of these evaluation models and the major questions they address.

SYSTEMS ANALYSIS MODEL. The *systems analysis model* is rooted in the principles of scientific management. This model is useful in answering questions about efficiency: "Are the expected effects achieved? Can the effects be achieved more economically? What are the most efficient programs?"

BEHAVIORAL OBJECTIVE MODEL. *Objectivity* and *quantitative measurement* are two key characteristics of the *behavior objective model.* This model was originally designed for curriculum design and revision, and is now widely used for evaluating educational and social programs. The most useful contribution of this model is that it provides for criterion measures against which the actual achievement can be compared to determine if the objectives have been achieved.

DECISION-MAKING MODEL. The *decision-making model* reflects the belief that evaluation should generate information that can facilitate intelligent judgement by decision makers.

GOAL-FREE EVALUATION MODEL. In *goal-free evaluations*, the evaluation focuses on the unanticipated as well as on the intended outcomes of a program.

ART CRITICISM MODEL. The *art criticism model* when used in evaluations of educational programs involves the use of expert judgements of the worth or merit of an educational program. This model assumes that the major objective of evaluation is to improve the overall standards of programs, and it further assumes agreement upon standards and the qualifications of critics.

ACCREDITATION MODEL. The *accreditation model* is the primary tool used by the North Central Association for accrediation of programs. The model has been adopted by many states for use in their program review process. The review process involves an internal evaluation of the program by local administrators and instructional staff according to pre-determined criteria, standards, and procedures. An external panel of experts then conducts an on-site evaluation using the same standards and criteria.

TRANSACTION MODEL. The *transaction model* primarily uses qualitative approaches and focuses on the educational process. Case studies, interviews, and observations are used to explore the activities that take place in the educational programs as they appear to different actors.

Evaluation Design

Dubravcic et al. (1986) defined evaluation design as a systematic plan for learning the answers to a specific set of questions about an educational program. Dubravcic et al. identified six major types of evaluation design based on the literature. The following sections briefly describe each of the evaluation designs.

FIXED EVALUATION. An evaluation design is *fixed* when the process is systematically planned in advance and all the procedures for data collection, analysis and reporting are spelled out in detail.

EMERGENT EVALUATION. *Emergent evaluation* responds to ongoing influences, evolving as it accommodates changes in the audience and program activities as well as problems.

FORMATIVE EVALUATION. *Formative evaluation* provides information to program planners for program improvement.

SUMMATIVE EVALUATION. *Summative evaluation* provides accountability information to funding agencies.

EXPERIMENTAL AND QUASI-EXPERIMENTAL EVALUATION. The emphasis in *experimental and quasi-experimental evaluation* is on close manipulation and close monitoring of a treatment under contract conditions with the ultimate goal of an establishment of a casual relationship between the educational program and its outcomes.

UNOBTRUSIVE INQUIRY. *Unobtrusive inquiry* (naturalistic inquiry) attempts to provide a thick description of reconstructed, multiple realities in a particular setting through in-depth case study methods. *Unobtrusive inquiry* makes use of an emergent design that unfolds with the progression of the inquiry process. *Unobtrusive inquiry* also makes use of intact groups in natural settings and does not control and manipulate treatments. This, however, does limit the generalizations that can be made, but the thorough description resulting from an *unobtrusive inquiry* does make provision for transferring conclusions to similar settings.

Options in Evaluation Design

Dubravcic et al. (1986) credit the widespread implementation of program evaluation to the accountability movement. Dubravcic et al. suggested there are seven options (components) of evaluation that apply to educational training programs. The following sections briefly describe each of these options of evaluation:

EVALUABILITY ASSESSMENT. *Evaluability assessment* is the procedure used to ensure that an evaluation effort will fulfill its goals. The purpose of this assessment is to estimate the extent to which the goals of an evaluation are likely to be met. *Evaluability assessment* should enable an administrator or an evaluator to determine whether it is appropriate to conduct a needs assessment; describe how programs were planned and implemented as well as how they operate; provide information to program planners for program improvement (*formative evaluation*); and to provide accountability information to funding agencies (*summative evaluation*).

NEEDS ASSESSMENT. *Needs assessment* is a formal program analysis that shows and documents the gaps between current results and desired results, arranges the gaps (needs) in order of priority, and selects the needs to be resolved. *Needs assessment* forms an integral part of program planning and evaluation. *Needs assessment* leads to decisions regarding program continuation, termination or modification. *Needs assessment* occurs at the organizational level.

INPUT EVALUATION. The main purpose of *input evaluation* is to provide the information needed to design a program to meet identified goals and objectives. Input evaluation assesses existing resources and determines additional resources needed to bring about desired changes. *Input evaluation* is a tool to help program planners consider alternative program options in the context of their needs and environmental circumstances and to evolve a plan that will be successful.

PROCESS EVALUATION. *Process evaluation* is used to monitor the implementation of an educational program. *Process evaluation* is essentially a formative type of evaluation in which the focus is on program monitoring and improvement.

OUTCOME EVALUATION. *Outcome evaluation* is part of the broad product evaluation process that assesses program outcomes and impact. The main purpose of *outcome evaluation* is to determine if the immediate program objectives have been met. The main focus of *outcome evaluation* is on immediate program effects, *impact evaluation* focuses on long-term effects. *Outcome* studies are similar to follow-up studies; both are intended to identify short-term consequences and longer term impact resulting from vocational education programs. *Outcome* studies of vocational education programs are used to provide information on the productivity, effectiveness and accountability of the programs. There is no set of procedures specifically designed for conducting outcome evaluation, but a variety of approaches used for other purposes can be combined to generate the information needed. Pre-test and post-test achievement and follow-up studies of graduates (participants) are examples of methods for generating *outcome* data.

IMPACT EVALUATION. Educational evaluation often ends with the determination of whether the program objectives have been met and the identification of the immediate outcomes of educational programs. Other important effects, both short and long-term, should be assessed if the full impacts of educational programs are to be known. These impacts can be measured in terms of the broader effect in terms of the individual, the business community, and for society as a whole.

COST-BENEFIT ANALYSIS/COST EFFECTIVENESS ANALYSIS. The process of assessing an educational program on the basis of its benefits in relation to cost is referred to as *cost-benefit analysis*. *Cost-effectiveness analysis* is an analytical techniques for assessing the outcomes of a program in relation to its specified objectives and against its cost.

This study focuses on components of an outcome evaluation with incorporates components of summative evaluation to be used in a formative manner. The model used most closely resembles the decision making model with selected aspects of the transaction model.

Summary of Literature Review

The research indicated access to accurate information is critical in the career/decision process. Super indicated this is especially critical for the gifted students. The Governor's School for the Agricultural Sciences is a program effort on the part of the Pennsylvania Department of Education and the state's educational intermediate units to provide accurate information and experiences to gifted students with an interest in the agricultural sciences.

Career development theory especially espoused by Super (1957) identified five vocational life stages. Program efforts such as PGSAS relate directly to Super's (1971) exploration stage. The work of Super and Bohn (1970) provided a framework for youth choosing various career options. Their work supported by Blau et al. (1971) identified knowledge regarding information relative to entry into careers as a critical determinant of career choice. Programming such as the PGSAS addresses Super's concern that career by choice is not an *accidental theory* but that career choice reflects more of a *self-concept* and *role theory*.

Silverman (1989) and Herr (1976) claimed an effective career guidance tool for gifted students is to provide them with real life experiences in some of their avenues of interest through internships, mentorships, work-study, or community based service. Olszewski-Kubilius (1989) identified numerous benefits of summer programs including: challenging coursework; intellectual and social peer interaction; independent living skills; social networking; college exposure; educational opportunities; and insight into self.

Evaluating program efforts such as the PGSAS in helping students make more informed career choices requires a multi-dimensional approach. The current literature on evaluation design requires a combination of a *decision making model* approach and a *transaction model* approach. It appears that a combination of *process* and *outcome* evaluation design options are most feasible in assessing the PGSAS. The evaluation will be addressed in Chapter 3 of this dissertation.

Chapter 3

DESIGN AND PROCEDURES

Clarification of Purpose

The primary purpose of this study was to determine if the Pennsylvania Governor's School for the Agricultural Sciences (PGSAS) provided the program participants with experiences and information which expanded their knowledge of educational and career opportunities related to food, agriculture and natural resources. A second purpose was to determine if the Governor's School experience provided program participants with an opportunity to explore scientific concepts, interact with professional scientists and to use research techniques available in the agricultural sciences.

Research Questions

The following research questions were formulated.

1. What factors influence educational aspirations of Pennsylvania Governor's School for the Agricultural Sciences program participants when examining background characteristics such as gender, residence status, parents' educational level, high school course of study, agricultural youth organization membership and their decision about a college major?
2. What factors influence career aspirations of Pennsylvania Governor's School for the Agricultural Sciences program participants when examining background characteristics such as gender, residence status, parents' educational level, high school course of study, agricultural youth organization membership and their decision about a college major?
3. Are there differences in perceptions of Pennsylvania Governor's School for the Agricultural Sciences program participants regarding careers in or related

to food, agriculture and natural resources when examining background characteristics such as gender, residence status, parents' educational level, high school course of study, agricultural youth organization membership and their decision about a college major?

4. Are there differences regarding extent of perceived benefits and the degree of satisfaction with the independent research (IRP)/independent study project (ISP) of Pennsylvania Governor's School for the Agricultural Sciences program participants when examining background characteristics such as gender, high school course of study, intent to attend graduate school and their decision about a college major?

General Design

The design of the study consisted of a descriptive survey with data collected from program participants of the 1986 - 1990 PGSAS classes. Data were used to determine sociodemographic characteristics, education and career plans, factors influencing education and career choices and current perceptions regarding careers in or related to food, agriculture and natural resources.

Population

The population for the study involved a census of program participants from the Pennsylvania Governor's School for the Agricultural Sciences classes of 1986 through the class of 1990, totaling 313 participants (total number of program participants was 317; two participants were deceased and two participants were classified as missing).

Instrumentation

The instrumentation for the study was completed in five phases: (1) review of literature, (2) development of the instrument, (3) review of the instrument by a panel of experts, (4) pilot testing of the instrument, and (5) calculation of instrument reliability.

The survey instrument for the study was designed to examine education and career plans, factors influencing education and career choices, current perceptions regarding careers in or related to food, agriculture and natural resources and personal growth and development resulting from their Governor's School experience. One questionnaire was developed then modified into two versions to accommodate program participants currently enrolled in high school and program participants who graduated from high school. The questionnaire was divided into five parts: (1) education and career plans, (2) employment, (3) current perceptions regarding careers in or related to food, agriculture and natural resources, (4) personal growth and development, and (5) general information.

Review of Instrument by Panel of Experts

A panel of eight experts were enlisted to review the draft questionnaire for content validity and clarity. The panel members included: Dr. John Sheridan, Guidance Counselor/Director of the Learning Enrichment Gifted/Special Education Program, State College Area School District; Dr. Jeff Garis, Director Career Development and Placement Services, The Pennsylvania State University; Dr. Gene Love, Associate Dean Emeritus, Agricultural Education, The Pennsylvania State University; Dr. Mary Klinedinst, University Director, Pennsylvania Governor's School for Teaching, Millersville University; Dr. Gene Van Dyke, Director, Pennsylvania Governor's Schools of Excellence; Ms. Juliana Baker, Assistant Director, Pennsylvania Governor's School for the Agricultural Sciences, The Pennsylvania State University; Mr. Timothy Winters, Senior,

Agricultural Science, College of Agriculture, The Pennsylvania State University; and Ms. MeeCee Baker, Teacher of Agricultural Education, Greenwood High School.

A cover letter explaining the purpose and objectives of the study along with the questionnaire was sent to the panel of experts on November 20, 1991. Comments received from the panel of experts resulted in deletion and addition of some statements, rephrasing of certain statements, and the improvement of the instrument's clarity.

Pilot Testing of the Instrument

After incorporating the suggestions made by the panel of experts, three parts of the high school questionnaire were pilot tested for validity: part one, section C, sub-part two, factors or issues in choice of a career; part three, current perceptions regarding careers in or related to food, agriculture and natural resources; and part five, general information. The pilot test was conducted with four sections of the Freshman Seminar (Ag 198) in the College of Agriculture at Penn State and also with two classes of high school agricultural science students in an urban high school.

On November 29, 1990, a cover letter and copies of the instrument were distributed to the Freshman Seminar instructors to administer to their classes by December 7, 1990. On November 29, 1990, a cover letter and copies of the instrument were mailed to an urban agriculture science teacher to administer to his students by December 7, 1990. Responses were collected from 107 individuals and a Cronbach's alpha reliability of .67 was calculated.

Instrument Description

One questionnaire was developed and modified into two versions to accommodate PGSAS program participants currently enrolled in high school and PGSAS program participants who had graduated from high school. The high school questionnaire consisted

of 133 items organized in five distinct parts (see Appendix B). The high school graduate (college) questionnaire consisted of 136 items organized in five distinct parts (see Appendix B).

Each version of the questionnaire began with a filter question to establish the program participants plans the first year following graduation from high school. Program participants who had planned to or pursued some form of formal postsecondary education following high school graduation were instructed to complete all questions in part one plus all questions in parts three, four and five.

Program participants who had not planned or did not pursue some form of formal postsecondary education since graduation from high school were instructed to proceed to part two and to complete all questions plus all questions in parts three, four and five. The primary difference between the high school questionnaire and the high school graduate questionnaire occurred in part one.

High School Questionnaire Part One

In part one of the high school questionnaire, program participants were asked to respond to questions which related to future education and career plans. Part one was divided into three sections totaling 81 items.

Part one, section A of the high school questionnaire included items pertaining to future formal education plans such as classification of future major and minor, first, second and third choice of institution, and future plans to attend graduate school. Part one, section A totaled eight items.

Part one, section B of the high school questionnaire included items pertaining to future career plans such as type of career, job title, and when the respondent first considered the career indicated. Part one, section B totaled three items.

Part one, section C, of the high school questionnaire was divided into three

sub-parts and five additional questions. The three sub-parts were adapted with permission from the Farm Foundation (1989) study called High School Students Perceptions of Agricultural College Majors and Careers. Part one, section C totaled 70 items.

Part one, section C, sub-part one included items pertaining to individuals influencing education and career choice. The scale for section C, sub-part one was a four-point, Likert-type rating system (0 = not applicable/available; 1 = no influence; 2 = some influence; and 3 = strong influence). Section C, sub-part one totaled 30 items.

Part one, section C, sub-part two included items pertaining to important factors or issues in choosing a career. The scale for section C, sub-part two was a three-point, Likert-type rating system (1 = not important; 2 = somewhat important; and 3 = very important). Section C, sub-part two totaled 23 items.

Part one, section C, sub-part three included items pertaining to important factors or issues in choosing a college major. The scale for section C, sub-part three was a three-point, Likert-type rating system (1 = not important; 2 = somewhat important; and 3 = very important). Section C, sub-part three totaled 12 items.

Part one, section C, of the high school questionnaire concluded with five additional questions dealing with an event or experience that influenced respondents' choice of college and or career and the effect of the Governor's School experience on that decision.

<u>High School Graduate Questionnaire Part One</u>

In part one of the high school graduate questionnaire, program participants were asked to respond to questions which related to future education and career plans. Part one was divided into four sections totaling 84 items.

Part one, section A of the high school graduate questionnaire included items pertaining to their formal education involvement since high school including college grade-

point average, classification and name of their major and minor and name of the higher education institution. Part one, section A totaled eight items.

Part one, section B of the high school graduate questionnaire included items pertaining to future educational plans and totaled three items. Part one, section C included items pertaining to future career plans such as type of career, job title and when the program participant first considered the career indicated. This section directly corresponded to part one, section B of the high school questionnaire and totaled three items.

Part one, section D directly corresponded to part one, section C of the high school questionnaire. Part two, three and four of both versions of the questionnaires were identical in content and design.

Questionnaire Part Two

Part two of the questionnaire was to be completed by program participants who had not planned or had not pursued some form of formal postsecondary education since graduation from high school. Part two included items pertaining to employment such as the classification of employment, specific job title and future plans to attend college and earn a degree.

Questionnaire Part Three

In part three of the questionnaire, program participants were asked to respond to questions which pertained to current perceptions regarding careers in or related to food, agriculture and natural resources. This part of the survey totaled 27 items and was adapted, with written permission, from the Farm Foundation (1989) study called High School Student Perceptions of Agricultural College Majors and Careers.

The scale for part three was a Likert-type weighted scale as follows:

Response Choice	Scoring Weight
No opinion	0
Strongly disagree	1
Disagree	2
Neutral/Not sure	3
Agree	4
Strongly Agree	5

Questionnaire Part Four

In part four of the questionnaire program participants were asked to respond to questions which pertained to personal growth and development. This part of the survey contained nine items. Questions one through six and questions eight and nine used an open format allowing the program participants to make any response they wished in their own words. Items one through six each contained two sub-parts. Question seven used a Likert-type scale.

Sub-part one of questions one through six asked program participants what new knowledge or information they gained from participation in PGSAS relative to careers and educational opportunities in food, agriculture and natural resources, leadership, interpersonal skills, communication skills and conducting research.

Sub-part two of questions one through six asked program participants how they have used this new knowledge or information relative to careers and educational opportunities in food, agriculture and natural resources, leadership, interpersonal skills, communication skills and conducting research.

Item seven in part four consisted of two sub-parts with a total of 13 items. In sub-part A program participants were asked to respond to questions which pertained to the benefits of conducting their independent research project (IRP)/independent study project (ISP) in relationship to their own career and educational goals. The scale for sub-part A

was a Likert-type rating system (0 = no benefit ; 1 = neutral/not sure; 2 = slightly beneficial; and 3 = extremely beneficial).

In sub-part B program participants were asked to respond to questions which pertained to their satisfaction with various aspects of the IRP/ISP. The scale for sub-part B was a Likert-type rating system (1 = very dissatisfied; 2 = neutral/not sure; 3 = slightly satisfied; and 4 = very satisfied).

Items eight and nine were open format questions dealing with program participants' personal benefit from the Governor's School experience and also their suggestions for enhancing the experience for future scholars.

Questionnaire Part Five

Part five of the current high school enrollees and high school graduate questionnaires were very similar but not identical; each part, however, totaled 12 items. In this part of both the high school and high school graduate questionnaires, program participants were asked to respond to questions which pertained to demographic information such as sex, race, where they lived most of their life, parent's/guardian's occupation, parent's/guardian's highest level of education, course of study in high school, high school grade-point average, membership in FFA and 4-H, Governor's School class attended and grade level completed prior to attending Governor's School.

Part five of the high school questionnaire included a question on current high school class status. Part five of the high school graduate questionnaire included a question regarding merit scholar recognition. These two questions account for the difference between the two questionnaires in part five.

Data Collection Procedures

Securing Names of Program Participants

The Office for Resident Education in the College of Agriculture at The Pennsylvania State University maintained a computerized data base on all program participants of the Pennsylvania Governor's School for the Agricultural Sciences.

Approximately 59 percent (58.59%) of the class of 1989 and 1990 were under the age of 18 at the time the questionnaires were mailed. Data were collected in accordance with the procedures submitted to and approved by the Office of the Protection of Human Subjects, The Pennsylvania State University (see Appendix C).

Collection of Information from Program Participants

The sequence followed in data collection was a modification of Dillman's (1978) Total Design Method. The sequence for data collection was as follows:

1. Telephone precontact was made one week to ten days prior to the mailing of the questionnaire. This was to verify program participants' home address, acquire their college address, and to briefly explain the study and to answer questions they might have had.
2. A cover letter (see Appendix C), number coded questionnaire (see Appendix B), and self-addressed, stamped envelope were mailed directly to each program participant on December 21, 1990. A letter for parental consent and self-addressed, stamped envelope were included with those questionnaires for the program participants under 18 years of age.
3. A follow-up postcard and duplicate coded questionnaire were mailed between January 21-24, 1991, to contact those non-respondents who had

not yet returned the questionnaire. (Approximately 32 days after the initial mailing--researcher had to allow adequate time for students to return to college for up-coming spring semester.)

4. Follow-up phone calls were made between February 4 - 14, 1991, to contact those non-respondents who had not yet returned the questionnaire.

Of the 235 respondents, over 50 percent (51.44%) returned the questionnaire during the first mailing period. The subsequent mailing produced an additional 12 percent (12.14%). The telephone follow-up produced an additional 11 percent (11.50%). The final response rate of 75 percent (75.08%) for the study was calculated by dividing the total number of responses (235) by the total number of past participants (313) receiving questionnaires. If we had included non-respondent information relative to background characteristics such as gender, residence, high school curriculum, and parents' educational and occupational background there would be no difference between respondents and non-respondents.

Table 5 shows the number and percentage of responses based on mailing dates and phone calls.

Table 5. Number and Percentage of Returns from An Assessment of Pennsylvania Governor's School for the Agricultural Sciences.

Time and Date of Contact	N	% of Returns
Telephone Pre-contact Dec. 11 - 20, 1990		
First Mailing Dec. 21, 1990	161	51.44
Second Mailing Jan. 21-24, 1991	38	12.14
Telephone Follow-up Feb. 4-14, 1991	36	11.50
Total Returns	235	75.08

Data Analysis

The data collected from the 235 returned questionnaires were coded and transferred into the computer for analyses at the Computation Center of The Pennsylvania State University. The Statistical Package for the Social Sciences (SPSS - 4.1) was used to analyze the data. Frequency distributions, means, correlations and percentages were the descriptive statistics utilized.

Chapter 4

FINDINGS

The primary purpose of this study was to determine if the Pennsylvania Governor's School for the Agricultural Sciences (PGSAS) provided the program participants with experiences and information which expanded their knowledge of educational and career opportunities related to food, agriculture and natural resources. A second purpose was to determine if the Governor's School experience provided program participants with an opportunity to explore scientific concepts, interact with professional scientists and to use research techniques available in the agricultural sciences.

The study findings are presented in the following major sections:

- profile of program participants
- current perceptions regarding agricultural careers in or related to food, agriculture and natural resources
- influences on choice of college major
- influences on choice of career
- educational aspirations
- career aspirations
- assessment of research experience

Profile of PGSAS Program Participants

This section briefly describes selected sociodemographic characteristics of PGSAS program participants who completed and returned the instrument. Although 235 usable questionnaires were returned by PGSAS program participants, some questions were not answered by all the respondents. Therefore, the total number of respondents may vary from characteristic to characteristic.

Sociodemographic Characteristics

Over half (56.0%) of the PGSAS program participants were female (Table 6). Forty-four percent were male. The majority (90.4%) of program participants were white or Anglo-American. Two-thirds (67.7%) of the program participants either lived in the suburbs (22.8%), in the country (18.5%) or on a farm (26.3%).

Parents' Educational and Occupational Background

The majority (58%) of the program participants' fathers were college graduates (Table 7). Over 40 percent (40.8%) of the fathers had completed graduate work beyond the bachelor's degree. About one-fifth (20.2%) of the fathers' highest level of education attained was a high school degree or they had passed the General Educational Development (GED) test.

Almost 50 percent (47.6%) of the program participants' mothers were college graduates. About one-quarter (23.8%) of the mothers had completed graduate work beyond the bachelor's degree. Twenty-five percent (25.1%) of the mothers were high school graduates or passed the GED test.

Half (50.4%) of the program participants' father's occupations were classified as professional . This classification included doctors, accountants, teachers, lawyers, and nurses. Over one-third (39.9%) of the program participants' mother's occupations were classified as professional/technical. A quarter (24.9%) of the program participants' mothers were full-time homemakers.

High School Program Information

The majority (77.2%) of the program participants were enrolled in the college preparatory curriculum during high school (Table 8). This has increased from 66 percent in 1986, the first year of PGSAS, to a high of 86 percent in 1990. About 2 percent (1.7%)

Table 6. Sociodemographic Characteristics of Pennsylvania Governor's School for the Agricultural Sciences (PGSAS) Program Respondents Reported by Year.

	Year Attended PGSAS											
	1986		1987		1988		1989		1990		Total	
Variable	N	%	N	%	N	%	N	%	N	%	N	%
Gender												
Male	16	42.1	21	45.7	23	47.9	22	44.9	21	39.6	103	44.0
Female	22	57.9	25	54.3	25	52.1	27	55.1	32	60.4	131	56.0
	38	100.0	46	100.0	48	100.0	49	100.0	53	100.0	234	100.0
Race												
Black or Afro-American	0	0.0	1	2.2	0	0.0	2	4.2	0	0.0	3	1.3
Hispanic	0	0.0	0	0.0	0	0.0	1	2.1	0	0.0	1	.5
Oriental or Asian American	1	2.7	3	6.5	1	2.1	4	8.3	6	11.5	15	6.5
White or Anglo-American	36	97.3	42	91.3	45	95.7	39	81.2	46	88.5	208	90.4
Other/Indian	0	0.0	0	0.0	1	2.2	2	4.2	0	0.0	3	1.3
	37	100.0	46	100.0	47	100.0	48	100.0	52	100.0	230	100.0
Residence												
Lg. Metropolitan City (>500,000)	2	5.3	5	10.6	6	12.5	3	6.1	2	4.0	18	7.8
Medium City (50,000 - 500,000)	0	0.0	0	0.0	2	4.2	4	8.2	4	8.0	10	4.3
Smaller City (20,000 - 49,999)	5	13.2	7	14.9	5	10.4	2	4.1	6	12.0	25	10.8
Suburb	8	21.1	9	19.1	11	22.9	14	28.6	11	22.0	53	22.8
Town or Village (<10,000)	4	10.5	2	4.3	5	10.4	5	10.2	6	12.0	22	9.5
Country (Outside City or Village)	4	10.5	11	23.4	5	10.4	13	26.5	10	20.0	43	18.5
On a Farm	15	39.4	13	27.7	14	29.2	8	16.3	11	22.0	61	26.3
	38	100.0	47	100.0	48	100.0	49	100.0	50	100.0	232	100.0

Table 7. Parents' Educational and Occupational Background of Pennsylvania Governor's School for the Agricultural Sciences (PGSAS) Program Respondents Reported by Year.

	Year Attended PGSAS											
	1986		1987		1988		1989		1990		Total	
Variable	N	%	N	%	N	%	N	%	N	%	N	%
Father's Education												
Less H.S. Diploma	4	10.5	1	2.1	2	4.2	1	2.1	2	3.8	10	4.3
H.S. Graduate/GED	10	26.3	13	27.7	10	20.8	10	20.8	4	7.7	47	20.2
Voc Technical	5	13.2	7	14.9	6	12.5	2	4.2	7	13.5	27	11.6
Some College	0	0.0	4	8.5	5	10.4	2	4.2	3	5.8	14	6.0
College Graduate	4	10.5	5	10.6	7	14.6	12	25.0	12	23.1	40	17.2
Graduate Work	15	39.5	17	36.2	18	37.5	21	43.8	24	46.2	95	40.8
	38	100.0	47	100.0	48	100.0	48	100.1	52	100.1	233	100.0
Mother's Education												
Less H.S. Diploma	1	2.6	1	2.1	1	2.1	1	2.0	1	1.9	5	2.1
H.S. Graduate/GED	12	31.6	13	27.7	15	31.3	11	22.4	8	15.1	59	25.1
Voc Technical	3	7.9	6	12.8	9	18.8	6	12.2	5	9.4	29	12.3
Some College	2	5.3	5	10.6	4	8.3	10	20.4	9	17.0	30	12.8
College Graduate	9	23.7	9	19.1	8	16.7	13	26.5	17	32.1	56	23.8
Graduate Work	11	28.9	13	27.7	11	22.9	8	16.3	13	24.5	56	23.8
	38	100.0	47	100.0	48	100.1	49	99.8	53	100.0	235	100.0
Father's Occupation												
Professional/Technical	14	36.8	20	43.5	26	55.3	25	52.1	32	60.4	117	50.4
Manager/Proprietor	12	31.6	9	19.6	10	21.3	8	16.7	10	18.9	49	21.1
Clerical	0	0.0	0	0.0	1	2.1	1	2.1	1	1.9	3	1.3
Sales	1	2.6	2	4.3	0	0.0	2	4.2	1	1.9	6	2.6
Craftsman/Foreman	2	5.3	5	10.9	2	4.3	2	4.2	2	3.8	13	5.6
Operative	2	5.3	4	8.7	2	4.3	5	10.4	3	5.7	16	6.9
Service	1	2.6	3	6.5	4	8.5	2	4.2	1	1.9	11	4.7
Laborer	2	5.3	0	0.0	0	0.0	2	4.2	2	3.8	6	2.6
Other	4	10.5	3	6.5	2	4.2	1	2.1	1	1.9	11	4.8
	38	100.0	46	100.0	47	100.0	48	100.0	53	100.0	232	100.0

(continued on next page)

Table 7 (continued)

Variable	Year Attended PGSAS											
	1986		1987		1988		1989		1990		Total	
	N	%	N	%	N	%	N	%	N	%	N	%
Mother's Occupation												
Professional/Technical	20	52.6	17	36.2	17	36.2	16	33.3	23	43.4	93	39.9
Manager/Proprietor	2	5.3	3	6.4	1	2.1	4	8.3	2	3.8	12	5.2
Clerical	1	2.6	8	17.0	8	17.0	8	16.7	8	15.1	33	14.2
Homemaker	10	26.3	13	27.7	15	31.9	9	18.8	11	20.8	58	24.9
Sales	0	0.0	0	0.0	2	4.3	2	4.2	0	0.0	4	1.7
Craftsman/Foreman	0	0.0	0	0.0	0	0.0	0	0.0	2	3.8	2	.9
Operative	0	0.0	1	2.1	2	4.3	1	2.1	0	0.0	4	1.7
Service	1	2.6	3	6.4	0	0.0	4	8.3	4	7.4	12	5.2
Laborer	0	0.0	0	0.0	0	0.0	1	2.1	2	3.8	3	1.3
Other	4	10.6	2	4.2	2	4.2	3	6.2	1	1.9	12	5.0
	38	100.0	47	100.0	47	100.0	48	100.0	53	100.0	233	100.0

Note: Parents'/guardians' level of eduction was broken down into six categories: less than high school diploma, graduated form high school or high school equivalent (GED), vocational/technical training after high school, some college but didn't graduate, college graduate (bachelor's degree) and graduate work (beyond bachelor's degree).

Occupational categories included in the study were derived from a list of occupational titles published by the U.S. Bureau of the Census (1950).

Table 8. High School Program Information for Pennsylvania Governor's School for the Agricultural Sciences (PGSAS) Program Respondents Reported by Year.

	Year Attended PGSAS											
	1986		1987		1988		1989		1990		Total	
Variable	N	%	N	%	N	%	N	%	N	%	N	%
Course of Study in High School												
General	4	10.5	6	13.0	2	4.3	3	6.1	1	1.9	16	6.9
College Preparatory	25	65.7	32	69.6	37	78.7	39	79.6	46	88.5	179	77.2
Vocational	1	2.6	0	0.0	3	6.4	0	0.0	0	0.0	4	1.7
Vocational/College	6	15.8	7	15.2	5	10.6	7	14.3	4	7.7	29	12.5
Other	2	5.3	1	2.2	0	0.0	0	0.0	1	1.9	4	1.7
	38	100.0	46	100.0	47	100.0	49	100.0	52	100.0	232	100.0
High School Grade-Point Average												
A (4.00)	9	23.7	15	31.9	21	43.8	24	49.0	25	47.2	94	40.0
A- (3.67 - 3.99)	21	55.3	19	40.4	16	33.3	18	36.7	25	47.2	99	42.1
B+ (3.33 - 3.66)	5	13.1	9	19.2	6	12.5	6	12.2	3	5.6	29	12.3
B (3.00 - 3.32)	3	7.9	4	8.5	5	10.4	0	0.0	0	0.0	12	5.1
B- (2.67 - 2.99)	0	0.0	0	0.0	0	0.0	1	2.1	0	0.0	1	.5
	38	100.0	47	100.0	48	100.0	49	100.0	53	100.0	235	100.0
Year In H.S. Completed at Time of Attendance												
Sophomore Year	17	44.7	20	42.6	15	31.2	13	26.5	14	26.4	79	33.6
Junior Year	21	55.3	27	57.4	33	68.8	36	73.5	39	73.6	156	66.4
	38	100.0	47	100.0	48	100.0	49	100.0	53	100.0	235	100.0
Agricultural Youth Organization Membership												
FFA	2	5.4	8	17.4	8	17.0	5	10.2	3	5.9	26	11.3
4-H	6	16.2	9	19.6	4	8.5	9	18.3	10	19.6	38	16.5
Both FFA & 4-H	6	16.2	3	6.5	3	6.4	4	8.2	3	5.9	19	8.3
Never FFA or 4-H	23	62.2	26	56.5	32	68.1	31	63.3	35	68.6	147	63.9
	37	100.0	46	100.0	47	100.0	49	100.0	51	100.0	230	100.0

of the program participants were enrolled in the vocational curriculum. An additional 13 percent (12.5%) indicated they were in a combined vocational/college preparatory high school curriculum. There has been a decrease in the proportion of PGSAS participants who reported they were in a high school general curriculum. Eleven percent (10.5%) of the 1986 PGSAS participants reported they were in the general curriculum compared to two percent (1.9%) of the 1990 PGSAS participants.

The majority (82.1%) of the program participants had a high school grade-point average (HSGPA) of 3.67 - 4.00, with 40 percent having a 4.00 HSPGA. Less than one percent (.4%) of the program participants had a grade-point average below a B (2.67 - 2.99). Two-thirds (66.4%) of the program participants were rising seniors at the time they completed the PGSAS program. The majority (63.9%) of the program participants had never been a member of FFA or 4-H.

National Merit Scholar Recognition

Over one-third (37.7%) of the PGSAS program participants received National Merit Scholar recognition (Table 9). One-third (34.8%) of the program participants receiving the recognition were finalists (Table 10).

Educational Activity First Year After High School

About 60 percent (58.3%) of PGSAS program participants attended a public 4-year institution following high school graduation. An additional 29 percent (28.5%) attended a private 4-year institution following graduation from high school.

Current Perceptions Regarding Careers in or Related to Food, Agriculture and Natural Resources

This section examines the participants' current perceptions regarding agricultural careers. The 27 perception statements were grouped into categories based on the

Table 9. National Merit Scholar Recognition of Pennsylvania Governor's School for the Agricultural Sciences (PGSAS) Program Respondents Reported by Year.

National Merit Scholar Recognition	Year Attended PGSAS											
	1986		1987		1988		1989		1990*		Total	
	N	%	N	%	N	%	N	%	N	%	N	%
Yes	14	35.9	17	36.2	20	42.6	17	34.7	1	100.0	69	37.7
No	25	64.1	30	63.8	27	57.4	32	65.3	0	0.0	114	62.3
	39	100.0	47	100.0	47	100.0	49	100.0	1	100.0	183	100.0

*One student was accepted early admission to college in lieu of their senior year in high school; other program participants were currently enrolled in high school.

Table 10. Level of National Merit Scholar Recognition of Pennsylvania Governor's School for the Agricultural Sciences (PGSAS) Program Respondents Reported by Year.

Level of National Merit Scholar Recognition	Year Attended PGSAS											
	1986		1987		1988		1989		1990*		Total	
	N	%	N	%	N	%	N	%	N	%	N	%
Commendable	6	42.9	5	29.4	16	80.0	9	52.9	1	100.0	37	53.6
Semi-finalist	3	21.4	4	23.5	0	0.0	1	5.9	0	0.0	8	11.6
Finalist	5	35.7	8	47.1	4	20.0	7	41.2	0	0.0	24	34.8
	14	100.0	17	100.0	20	100.0	17	100.0	1	100.0	69	100.0

*One student was accepted early admission to college in lieu of their senior year in high school; other program participants were currently enrolled in high school.

investigator's interpretation of the general meaning for each statement. The first section identifies the overall perceptions with subsequent sections examining associations in perceptions by selected participant background characteristics. The background characteristics examined included gender, current residence area, parents' educational level, high school curriculum studied, prior agricultural youth organization membership and participants' decision regarding a major of study in college. Relative to the general category preparation for agricultural careers, almost two-thirds of the program participants disagreed that most colleges of agriculture have a vocational orientation (64.6%) and that most colleges are located in the midwest (63.8%; Table 11). The large majority of PGSAS program participants disagreed that most agriculture-related careers do not require education beyond high school (93.6%) and that you should either be a farmer or have worked on a farm to enter an agriculture-related career (93.1%).

Within the context of the outlook for agricultural careers, two-thirds of the program participants disagreed that the number of agriculture jobs is declining (66.1%) and that agricultural occupations generally are viewed with the same level of prestige by the general public as are other occupations (66.0%). Seventy-nine percent disagreed that there are limited advancement opportunities in agricultural careers.

Generally PGSAS participants viewed the agricultural working environment to be attractive to females or minorities, and they reported agriculture included working in urban areas and not limited to manual work. The majority of program participants disagreed that agriculture-related careers are not attractive to females (83.7%) or minorities (62.7%). Relative to career alternatives, seventy percent (70.0%) of the program participants agreed that graduates with college degrees in agriculture or agriculture-related majors are desired by many multinational corporations. The majority (61.8%) of the program participants were neutral as to whether graduates with college degrees in agriculture and agriculture-related majors are able to pursue science-oriented careers. Program participants also

Table 11. Current Perceptions of Program Respondents of the Pennsylvania Governor's School for the Agricultural Sciences (PGSAS) Regarding Careers in or Related to Food, Agriculture and Natural Resources.

Category And Perception Statement	N	Perception Response Option: Strongly Disagree %	Disagree %	Neutral %	Agree %	Strongly Agree %
Preparation for Careers in Agriculture						
Most Colleges of Ag are Vocational	232	29.3	35.3	27.6	3.9	.9
Most Ag Colleges Located in Midwest	232	16.4	47.4	32.3	3.4	0.0
Most Require no Education Beyond High School	232	48.3	45.3	2.2	2.6	.9
Outlook for Agricultural Careers						
Ag Grad Salaries are as High as Other Graduates	230	.9	17.8	28.3	38.7	12.6
Most Ag Careers are Farming	232	51.7	39.2	5.6	3.0	0.0
Need Farm Experience to Enter Ag Career	233	61.8	31.3	2.1	3.0	.9
Limited Advancement in Ag Careers	283	28.8	50.2	15.0	5.6	0.0

(continued on next page)

Table 11 (continued)

Category And Perception Statement	N	Perception Response Option: Strongly Disagree %	Disagree %	Neutral %	Agree %	Strongly Agree %
Ag Careers Require Knowledge of Farming	233	16.7	49.4	18.9	13.7	1.3
Number of Ag Jobs is Declining	233	24.5	41.6	29.2	3.0	1.3
Most Ag Careers Require Graduate Education	232	6.9	29.7	28.9	26.3	6.9
Ag Careers Other Than in Farming are in Farm Equipment Sales	232	32.3	44.0	12.5	9.1	.9
Ag Careers Equal Others in Level of Prestige	232	15.1	50.9	14.2	15.9	1.7
Working Environment in Agriculture						
Not Attractive to Females	233	42.1	41.6	9.0	3.9	.9
Often Work in Urban Areas	233	3.9	23.2	30.9	36.1	4.3
Involve Work Outdoors	233	7.7	54.5	25.3	12.0	0.0
Require Manual Labor	232	28.0	52.6	11.2	7.8	0.0

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Table 11 (continued)

Category And Perception Statement	N	Perception Response Option: Strongly Disagree %	Disagree %	Neutral %	Agree %	Strongly Agree %
Not Attractive to Minorities	233	21.5	41.2	23.6	6.0	1.3
People Choose Ag Careers to be Own Boss	232	3.9	31.5	37.9	20.3	.4
Career Alternatives						
Ag Graduates Often Pursue Business Careers	233	.9	6.9	37.8	45.5	6.9
Ag Graduates are Desired by Multinational Companies	233	.9	2.1	25.8	49.8	20.2
Ag Graduates are Able to Pursue Science Careers	233	.9	4.7	61.8	32.2	0.0
Ag Grads Lack Skills for Other Careers	232	38.8	52.2	7.3	.9	.4
Science Graduates can find Ag Careers	233	0.0	0.0	3.9	60.9	34.8
Business Graduates can find Agribusiness Careers	233	0.0	.4	6.0	70.0	22.7

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Table 11 (continued)

Category And Perception Statement	N	Perception Response Option: Strongly Disagree %	Disagree %	Neutral %	Agree %	Strongly Agree %
Scope of Agriculture						
Ag Careers Insecure -- Ag Economy Fluctuates	233	26.6	43.3	20.6	7.3	.9
Ag Careers Rarely Affected by World Events	233	38.6	44.2	10.3	2.6	1.7
Ag Careers Depend on Weather	233	11.2	48.1	19.3	18.5	.9

disagreed that most graduates of agriculture and agriculture-related programs lack skills for careers outside of agriculture (91.0%).

The majority of program participants disagreed that an agriculture-related career is not secure because the agricultural economy fluctuates (69.9%) as well as most careers in agriculture are very dependent on weather conditions, such as droughts and floods (59.3%). They disagreed (82.8%) that agricultural careers are rarely affected by world events.

Current Career Perceptions and Gender

Point-biserial correlation coefficients (Table 12) were calculated to describe the relationships between perceptions regarding careers in food, agriculture and natural resources and PGSAS program participants' gender. The point-biserial correlation was used instead of the Phi and/or Cramer's V because of the invalid X^2 results obtained for some perception statements (number of cells with expected frequency <5 was greater than 20%). The findings revealed there were low relationships, significant at the .01 alpha level, between participants' gender and perceptions regarding salary of agriculture graduates ($r_{pt\ bis} = .19$), attractiveness of agriculture careers to women ($r_{pt\ bis} = -.18$), and advances and opportunities in agricultural careers ($r_{pt\ bis} = -.18$). No other significant relationships were found between the other 24 perception statements and gender.

Although female ($M = 3.30$) participants as compared to male ($M = 2.93$) participants tended to have a slightly more positive perception that college graduates who major in agriculture and agriculture-related majors earn salaries as high as those earned by graduates in most other majors, both males and females basically expressed a neutral position.

Female ($M = 1.33$) PGSAS program participants tended to disagree more strongly than male ($M = 1.64$) PGSAS program participants that there is limited opportunity for

advancement for people employed in agriculture-related careers. That is, female PGSAS program participants tended to be slightly more optimistic than males regarding advancement opportunities in agricultural careers. Female (M = 1.21) PGSAS program participants also tended to disagree more strongly than male (M = 1.48) PGSAS program participants that agriculture-related careers are not attractive to females. In essence, female PGSAS program participants were slightly more positive than males in their perceptions that careers in agriculture are attractive to females. No other significant relationships between gender and career perceptions were found.

Table 12. Relationships Between Current Perceptions Regarding Careers in or Related to Food, Agriculture and Natural Resources and Pennsylvania Governor's School for the Agricultural Sciences (PGSAS) Program Respondents' Gender.

Category And Perception Statement	Male N	Male Mean[a] Score	Male S.D.	Female N	Female Mean Score	Female S.D.	Point-Biserial Correlation Coefficient
Outlook for Agricultural Careers							
Ag Graduates Salary as High as Other Graduates	97	2.93	1.24	128	3.30	1.01	.19**
Limited Advancement in Ag Careers	102	1.64	1.04	129	1.33	.83	-.18**
Working Environment In Agriculture							
Ag Careers not Attractive to Females	99	1.48	.96	127	1.21	.71	-.18**

[a]Perception scale was: 0 = no opinion; 1 = strongly disagree; 2 = disagree; 3 = neutral/not sure; 4 = agree; and 5 = strongly agree.

**$p \leq .01$.

Current Career Perceptions and Rural or Urban Residence

Table 13 shows point-biserial correlation coefficients calculated to describe relationships between PGSAS program participants place of residence and perceptions regarding careers in food, agriculture and natural resources. The findings revealed there were low, positive relationships between place of residence (urban vs rural) and perceptions regarding the level of education needed beyond high school for agricultural careers, the agricultural working environment, scope of agriculture and career opportunities.

Both rural and urban PGSAS participants disagreed with the statements that most agricultural careers require no education beyond high school, that most agriculture-related careers involve or require manual labor, that other agricultural career areas are in farm equipment and supply sales, and to a lesser extent that most people choose careers in agriculture to be their own boss.

Urban as compared with rural PGSAS program participants tended to disagree more strongly with the statements that most agriculture-related careers do not require education beyond high school ($r_{pt\ bis} = .14$; $p \leq .05$), agriculture careers involve or require manual labor ($r_{pt\ bis} = .14$; $p \leq .05$), agriculture careers are dependent on the weather ($r_{pt\ bis} = .19$; $p \leq .01$), and that agriculture careers other than farming are in farm equipment and supply sales ($r_{pt\ bis} = .18$; $p \leq .01$).

The findings revealed there was a low, negative relationship ($r_{pt\ bis} = -.11$), significant at the .05 alpha level, between PGSAS program participants' place of residence and their perceptions regarding security of agriculture careers in relationship to the economy. PGSAS program participants who lived in a rural area tended to disagree more strongly ($M = 1.44$) whereas urban PGSAS participants disagreed less ($M = 1.85$) that an agriculture-related career is not secure because the economy fluctuates. No additional

Table 13. Relationships Between Current Perceptions Regarding Careers in or Related to Food, Agriculture and Natural Resources and Pennsylvania Governor's School for the Agricultural Sciences (PGSAS) Program Respondents' Rural or Urban Residence.

Category And Perception Statement	Rural N	Rural Mean[a] Score	Rural S.D.	Urban N	Urban Mean Score	Urban S.D.	Point-Biserial Correlation Coefficient
Preparation for Careers in Agriculture							
Most Require no Education Beyond High School	103	1.22	.78	124	1.09	.44	.14*
Outlook for Agricultural Careers							
Ag Careers Other Than Farmers are in Farm Equipment Sales	104	1.71	1.18	122	1.43	.93	.18**
Working Environment in Agriculture							
Ag Careers Require Manual Labor	102	1.67	1.12	126	1.29	.80	.14*
People Choose Ag Careers to be Their Own Boss	101	2.48	1.26	114	2.48	1.15	.12*
Scope of Agriculture							
Ag Careers are Insecure Because Economy Fluctuates	104	1.44	.93	123	1.85	1.14	-.11*
Ag Careers are Dependent on the Weather	102	2.23	1.37	123	1.77	1.13	.19**

[a]Perception scale was: 0 = no opinion; 1 = strongly disagree; 2 = disagree; 3 = neutral/not sure; 4 = agree; and 5 = strongly agree.

Note: Rural was defined as in the country, outside of a city or village, and on a farm. Urban was defined as in the suburbs of a town or city or any area greater than 10,000 in population.

*$p \leq .05$.
**$p \leq .01$.

significant relationships were found between the other 21 perception statements and whether the PGSAS participant reported a rural or urban residence.

Current Career Perceptions and Farm or Non-Farm Residence

It was decided to further examine perceptions based on whether the PGSAS participant was classified as having a farm or non-farm residence. It must be acknowledged that this classification is based strictly on residence, and no implication is made relative to this representing an inclusive measure of agricultural experience.

Point-biserial correlation coefficients (Table 14) were calculated to describe the relationships between PGSAS program participants' farm or non-farm residence and perceptions regarding careers in food, agriculture and natural resources. The findings revealed there were low positive relationships, significant at the .01 alpha level, between PGSAS program participants farm or non-farm residence and perceptions regarding the level of education needed beyond high school for agricultural careers, the agricultural work environment and career opportunities. Both farm and non-farm PGSAS participants disagreed that most agricultural careers require no education beyond high school, that agriculture-related careers involve or require manual labor and that areas of agricultural opportunity other than farming are in farm equipment and supply sales. Non-farm as compared with farm PGSAS program participants tended to disagree more strongly with the statements that most agriculture-related careers do not require education beyond high school ($r_{pt\ bis} = .28$), agriculture careers require or involve manual labor ($r_{pt\ bis} = .15$), and agriculture careers other than farming are in farm equipment and supply sales ($r_{pt\ bis} = .16$).

The findings revealed there was a negative relationship ($r_{pt\ bis} = -.14$), significant at the .05 alpha level, between PGSAS program participants' farm or non-farm residence and their perceptions regarding whether graduate education was needed for agriculture

careers. PGSAS program participants who lived on a farm tended to disagree ($\underline{M}$ = 2.11) whereas non-farm PGSAS participants were neutral ($\underline{M}$ = 2.77) regarding agriculture careers requiring graduate-level education in fields such as genetics, microbiology and chemistry.

The findings revealed there were slight, positive relationships, significant at the .05 alpha level, between PGSAS program participants place of residence and their perceptions regarding the work environment in agriculture and the prestige of agricultural careers. Non-farm PGSAS program participants tended to disagree slightly more than farm PGSAS program participants that most people choose careers in agriculture because they can be their own bosses (by owning their own farm, business, etc.; $r_{pt\ bis}$ = .12) and that agricultural occupations generally are viewed with the same level of prestige by the general public as are other occupations ($r_{pt\ bis}$ = .13). No other significant relationships were found between the other 21 perception statements and farm and non-farm residence status for PGSAS participants.

Current Career Perceptions and Farm or City Residence

It was decided to further delineate non-farm PGSAS participants by identifying those that met the definition of city residence and determining the relationship between farm or city residence and perceptions regarding agricultural careers.

Point-biserial correlation coefficients (Table 15) were calculated to describe the relationships between city or farm residence and perceptions regarding careers in food, agriculture and natural resources. The findings revealed there were positive relationships between PGSAS program participants' farm or city residence and perceptions regarding the level of education needed beyond high school for agricultural careers, the agricultural work environment and the scope of agriculture. Both farm ($\underline{M}$ = 1.38) and city ($\underline{M}$ = 1.12) PGSAS program participants disagreed that most agricultural careers require no education

Table 14. Relationships Between Current Perceptions Regarding Careers in or Related to Food, Agriculture and Natural Resources and Pennsylvania Governor's School for the Agricultural Sciences (PGSAS) Program Respondents' Farm or Non-Farm Residence.

Category And Perception Statement	Farm N	Farm Mean[a] Score	Farm S.D.	Non-farm N	Non-farm Mean Score	Non-farm S.D.	Point-Biserial Correlation Coefficient
Preparation for Careers in Agriculture							
Most Ag Careers Require no Education Beyond High School	60	1.38	.99	167	1.07	.38	.28**
Outlook for Agricultural Careers							
Ag Careers Require Graduate Education	61	2.11	1.34	165	2.77	1.23	-.14*
Ag Careers Other Than Farming are in Farm Equipment Sales	61	1.80	1.24	165	1.47	.97	.16**
Ag Careers Equal Others in Level of Prestige	60	2.08	1.41	164	1.74	1.15	.13*
Working Environment In Agriculture							
Ag Careers Require Manual Labor	61	1.72	1.20	167	1.36	.86	.15**
People Choose Ag Careers to be Their Own Boss	58	2.64	1.27	157	2.42	1.18	.12*

[a]Perception scale was: 0 = no opinion; 1 = strongly disagree; 2 = disagree; 3 = neutral/not sure; 4 = agree; and 5 = strongly agree.

*$p \leq .05$.
**$p \leq .01$.

Table 15. Relationships Between Current Perceptions Regarding Careers in or Related to Food, Agriculture and Natural Resources and Pennsylvania Governor's School for the Agricultural Sciences (PGSAS) Program Respondents' Farm or City Residence.

Category And Perception Statement	Farm N	Farm Mean[a] Score	Farm S.D.	City N	City Mean Score	City S.D.	Point-Biserial Correlation Coefficient
Preparation for Careers in Agriculture							
Most Ag Careers Require no Education Beyond High School	60	1.38	.99	52	1.12	.47	.26**
Outlook for Agricultural Careers							
Ag Careers Require Graduate Education	61	2.11	1.34	50	3.04	1.18	-.23**
Working Environment In Agriculture							
Ag Careers Require Manual Labor	61	1.72	1.20	52	1.37	.89	.16*
Scope Of Agriculture							
Ag Careers are Dependent on Weather Conditions	61	2.11	1.38	50	1.74	1.17	.19*

[a]Perception scale was: 0 = no opinion; 1 = strongly disagree; 2 = disagree; 3 = neutral/not sure; 4 = agree; and 5 = strongly agree.

Note: City was defined as living in an area having 10,000 or more people.

*$p \leq .05$.
**$p \leq .01$.

beyond high school, involve or require manual labor, and are dependent on weather conditions.

City as compared to farm PGSAS program participants tended to disagree more strongly with the statements that most agriculture-related careers do not require education beyond high school ($r_{pt\ bis} = .26$; $p \leq .01$), agriculture careers involve or require manual labor ($r_{pt\ bis} = .16$; $p \leq .05$) and that agriculture careers are dependent on weather conditions ($r_{pt\ bis} = .19$; $p \leq .05$).

The findings revealed there was a negative relationship approaching a moderate level ($r_{pt\ bis} = -.23$) significant at the .01 alpha level, between PGSAS program participants' place of residence and their perceptions whether graduate education was needed for agriculture careers. PGSAS program participants who lived on a farm tended to disagree ($M = 2.11$) whereas PGSAS participants from the city were neutral ($M = 3.04$) toward the statement that agriculture careers require graduate-level education in fields such as genetics, microbiology and chemistry. No additional significant relationships were found between the other 23 perception statements and farm or city residence.

Current Career Perceptions Based on Father's Level of Education

It was decided to further examine program participants' perceptions based on their parent's/guardian's level of education. A .5 differential between the mean values was established as the criterion to identify substantial differences in their perception. This .5 differential between the mean scores was also used in subsequent sections to determine differences among program participants' perceptions based on their high school course of study, agricultural youth organization membership and major decision.

Table 16 describes the PGSAS program participants' current perceptions regarding careers in or related to food, agriculture and natural resources by father's level of education.

Table 16. Current Perceptions of Program Respondents of the Pennsylvania Governor's School for the Agricultural Sciences (PGSAS) Regarding Careers in or Related to Food, Agriculture and Natural Resources Based on Their Father's Level of Education.

Category, Perception Statement And Father's Level of Education	N	M[a]	S.D.
Preparation For Careers In Agriculture			
Most Colleges of Ag are Vocational			
Less H.S. Diploma	10	2.10	.99
H.S. Graduate/GED	47	2.36	1.01
Voc Technical	27	1.85	1.13
Some College	13	2.54	.78
College Graduate	39	1.87	.86
Graduate Work	94	1.90	.90
Most Require no Education Beyond High School			
Less H.S. Diploma	10	1.70	1.06
H.S. Graduate/GED	46	1.91	.89
Voc Technical	27	1.59	.69
Some College	14	1.43	.51
College Graduate	39	1.38	.88
Graduate Work	94	1.55	.58
Outlook for Agricultural Careers			
Ag Graduates Salaries are as High as Other Graduates			
Less H.S. Diploma	10	3.40	.97
H.S. Graduate/GED	45	3.38	1.07
Voc Technical	27	3.59	.93
Some College	14	3.57	.85
College Graduate	39	3.77	.96
Graduate Work	93	3.16	1.12
Most Ag Careers are Farming			
Less H.S. Diploma	10	1.60	.52
H.S. Graduate/GED	47	1.70	.86
Voc Technical	27	1.30	.54
Some College	14	1.79	.80
College Graduate	39	1.36	.67
Graduate Work	93	1.70	.73
Need Farm Experience to Enter Ag Career			
Less H.S. Diploma	10	1.30	.48
H.S. Graduate/GED	47	1.62	1.01
Voc Technical	27	1.44	.70
Some College	14	1.71	.82
College Graduate	39	1.20	.41
Graduate Work	94	1.51	.77

(continued on next page)

Table 16 (continued)

Category, Perception Statement And Father's Level of Education	N	M[a]	S.D.
Ag Careers Require Knowledge of Farming			
Less H.S. Diploma	10	3.20	1.03
H.S. Graduate/GED	47	2.64	1.05
Voc Technical	27	2.00	.83
Some College	14	2.71	.99
College Graduate	39	1.82	.72
Graduate Work	94	2.35	.89
Number of Ag Jobs is Declining			
Less H.S. Diploma	10	1.90	1.10
H.S. Graduate/GED	47	2.17	1.03
Voc Technical	27	1.93	.92
Some College	14	1.79	.58
College Graduate	39	1.95	.83
Graduate Work	94	2.34	.80
Most Ag Careers Require Graduate Education			
Less H.S. Diploma	10	3.50	1.65
H.S. Graduate/GED	47	2.89	1.20
Voc Technical	27	2.81	.92
Some College	14	3.07	.83
College Graduate	39	2.95	1.19
Graduate Work	93	2.89	1.06
Ag Careers Other Than in Farming are in Farm Equipment Sales			
Less H.S. Diploma	10	2.30	1.34
H.S. Graduate/GED	47	2.40	.97
Voc Technical	26	2.04	.92
Some College	14	2.21	1.05
College Graduate	39	1.74	1.04
Graduate Work	94	1.79	.84
Working Environment in Agriculture			
Often Work in Urban Areas			
Less H.S. Diploma	10	3.10	.88
H.S. Graduate/GED	47	2.87	.95
Voc Technical	27	2.85	1.03
Some College	14	3.36	1.08
College Graduate	39	3.41	1.04
Graduate Work	94	3.06	1.07

(continued on next page)

Table 16 (continued)

Category, Perception Statement And Father's Level of Education	N	M[a]	S.D.
Involve Work Outdoors			
Less H.S. Diploma	10	2.20	.42
H.S. Graduate/GED	47	2.32	.81
Voc Technical	27	2.41	.80
Some College	14	2.79	.89
College Graduate	39	2.46	1.00
Graduate Work	94	2.39	.76
Require Manual Labor			
Less H.S. Diploma	9	2.44	1.01
H.S. Graduate/GED	47	2.34	.96
Voc Technical	27	1.81	.83
Some College	14	1.86	.95
College Graduate	39	1.82	.76
Graduate Work	94	1.88	.76
Career Alternatives			
Ag Graduates are Desired by Multinational Corporations			
Less H.S. Diploma	10	3.60	.52
H.S. Graduate/GED	47	3.72	.88
Voc Technical	27	4.15	.77
Some College	14	3.86	.95
College Graduate	39	4.15	.78
Graduate Work	94	3.70	.93
Science Graduates can find Ag Careers			
Less H.S. Diploma	10	4.40	.52
H.S. Graduate/GED	47	4.12	.56
Voc Technical	27	4.00	.92
Some College	14	4.36	.50
College Graduate	39	4.52	.50
Graduate Work	94	4.33	.54
Scope Of Agriculture			
Ag Careers Insecure -- Ag Economy Fluctuates			
Less H.S. Diploma	10	1.60	.70
H.S. Graduate/GED	47	2.08	.93
Voc Technical	27	1.81	.68
Some College	14	1.93	.82
College Graduate	39	2.03	.90
Graduate Work	94	2.28	1.04

(continued on next page)

Table 16 (continued)

Category, Perception Statement And Father's Level of Education	N	M[a]	S.D.
Ag Careers Rarely Affected by World Events			
Less H.S. Diploma	10	1.10	.88
H.S. Graduate/GED	47	1.68	.86
Voc Technical	27	1.96	.90
Some College	14	2.07	.83
College Graduate	39	1.87	.95
Graduate Work	94	1.73	.88

[a]Perception scale was: 0 = no opinion; 1 = strongly disagree; 2 = disagree; 3 = neutral/not sure; 4 = agree; and 5 = strongly agree.

Note: Parents'/guardians' level of education was broken down into six categories: less than high school diploma, graduated from high school or high school equivalent (GED), vocational/technical training after high school, some college but didn't graduate, college graduate (bachelor's degree) and graduate work (beyond bachelor's degree).

In regard to preparation for careers in agriculture, PGSAS program participants whose fathers were high school graduates ($\underline{M}$ = 2.36) or had some college education ($\underline{M}$ = 2.54) tended to disagree to a lesser extent with the statement that most college-level agricultural programs are vocational in nature than program participants whose fathers had vocational/technical training ($\underline{M}$ = 1.85) after high school. Program participants whose fathers were college graduates ($\underline{M}$ = 1.38) tended to disagree to a greater extent than participants whose fathers either graduated from high school or had a high school equivalent GED ($\underline{M}$ = 1.91) toward the statement that most agriculture-related careers do not require education beyond high school.

In regard to the outlook for agricultural careers, program participants whose fathers had completed some form of graduate-level education ($\underline{M}$ = 3.16) tended to be neutral or not sure relative to college graduates who major in agriculture and agriculture-related majors earning salaries as high as those earned by graduates in most other majors. Program participants whose fathers were college graduates with a bachelor's ($\underline{M}$ = 3.77) or

some other form of postsecondary education tended to agree with the statement. Program participants whose fathers had vocational/technical training (M = 1.30) tended to disagree slightly more than program participants whose fathers had some college (M = 1.79) that most agriculture-related careers are in farming. Program participants whose fathers had a college degree (M = 1.20) tended to disagree slightly more than those whose fathers had some 4-year college education (M = 1.71) to the statement that you should either be a farmer or have worked on a farm to enter an agriculture-related career. Program participants whose fathers were college graduates (M = 1.82) tended to disagree that most agriculture-related careers require considerable knowledge of farms and farming; whereas, program participants whose fathers either had a high school diploma/GED (M = 2.64) or had some college (M = 2.71) tended to be neutral. Program participants whose fathers had completed graduate work (M = 2.34) tended to disagree with the statement that the number of job opportunities in agriculture-related careers is declining but to a lesser degree than program participants whose fathers had only some college (M = 1.79). Program participants whose fathers had less than a high school diploma (M = 3.50) tended to agree with the statement that most agriculture-related careers require graduate-level education in fields such as genetics, microbiology and chemistry as compared to program participants whose fathers had only vocational/technical training (M = 2.81). Program participants whose fathers were college graduates (M = 1.74) tended to disagree to a greater degree that most agriculture-related careers not in farming are in the sales of farm equipment and supplies than participants whose fathers had graduated from high school or received the GED (M = 2.40).

In regard to the working environment in agriculture, program participants whose fathers were college graduates (M = 3.41) tended to agree that people in agriculture-related careers often work in urban areas. Conversely, participants whose fathers had vocational/technical training (M = 2.85) after high school were more neutral toward the

statement. Program participants whose fathers had some college (M = 2.79) tended to be neutral toward the statement that most agriculture-related careers involve working outdoors. Participants whose fathers had less than a high school diploma (M = 2.20) tended to disagree. Program participants whose fathers had a vocational/technical training (M = 1.81) tended to disagree to a greater extent that most agriculture-related careers involve or require manual labor than program participants whose fathers only had a high school diploma or GED (M = 2.34).

Regarding career alternatives in the agriculture-related field, program participants whose fathers had a college degree (M = 4.15) tended to be more positive that graduates with college degrees in agriculture and agriculture-related majors are desired by many multinational corporations than participants whose fathers had less than a high school diploma (M = 3.60). Program participants whose fathers were college graduates (M = 4.52) tended to agree to a greater extent than program participants whose fathers had only vocational/technical (M = 4.00) after high school that people with college majors in the sciences can find employment in agriculture-related careers.

When considering the scope of the agricultural industry, program participants whose fathers had less than a high school diploma (M = 1.60) tended to disagree that an agriculture-related career is not secure because the agricultural economy fluctuates than did program participants whose fathers had completed graduate education (M = 2.28). Program participants whose fathers had less than a high school diploma (M = 1.10) tended to disagree to a much greater extent that agricultural careers and career opportunities are rarely effected by world events than any other program participant, especially those whose fathers had some college (M = 2.07). There were no other significant differences between PGSAS program participants' perceptions based on their father's level of education and the remaining 11 perception statements.

Current Career Perceptions Based on Mother's Level of Education

Table 17 describes PGSAS program participants' current perceptions regarding careers in or related to food, agriculture and natural resources by their mother's level of education. When work environment was explored, PGSAS program participants whose mothers had some college (M = 3.37) tended to agree to a greater extent with the statement that people in agriculture-related careers often work in urban areas than participants whose mothers had a high school diploma or GED (M = 2.78) who tended to be more neutral or not sure.

In regard to career alternatives related to agriculture, program participants whose mothers had some college (M = 4.17) tended to be more positive toward the statement that graduates with college degrees in agriculture and agriculture-related majors are desired by many multinational corporations than were participants whose mothers had a high school diploma or GED (M = 3.63).

When the scope of the agricultural industry was explored, program participants whose mothers were college graduates (M = 2.33) tended to agree slightly more than participants whose mothers only had some college (M = 1.73) with the statement that an agriculture-related career is not secure because the agricultural economy fluctuates. Program participants whose mothers had vocational/technical training (M = 2.12) after high school tended to disagree with the statement that most careers in agriculture are dependent on weather conditions such as droughts and flood. Conversely, program participants whose mothers had a high school diploma or GED (M = 2.61) tended to be more neutral or not sure toward the statement. There were no additional significant differences between PGSAS program participants' perceptions based on their mother's level of education and the remaining 23 perception statements.

Table 17. Current Perceptions of Program Respondents of the Pennsylvania Governor's School for the Agricultural Sciences (PGSAS) Regarding Careers in or Related to Food, Agriculture and Natural Resources Based on Their Mother's Level of Education.

Category, Perception Statement And Mother's Level of Education	N	M[a]	S.D.
Working Environment in Agriculture			
Often Work in Urban Areas			
Less H.S. Diploma	5	3.60	.55
H.S. Graduate/GED	59	2.78	1.13
Voc Technical	28	3.21	1.03
Some College	30	3.37	.93
College Graduate	55	2.98	1.10
Graduate Work	56	3.25	.88
Career Alternatives			
Ag Graduates are Desired by Multinational Corporations			
Less H.S. Diploma	5	3.80	1.64
H.S. Graduate/GED	59	3.63	.93
Voc Technical	28	3.89	.68
Some College	30	4.17	.79
College Graduate	55	3.87	1.02
Graduate Work	56	3.77	.76
Scope Of Agriculture			
Ag Careers Insecure -- Ag Economy Fluctuates			
Less H.S. Diploma	5	1.40	.89
H.S. Graduate/GED	59	1.98	.92
Voc Technical	28	2.00	.82
Some College	30	1.73	.69
College Graduate	55	2.33	1.02
Graduate Work	56	2.25	.99
Ag Careers Depend on Weather			
Less H.S. Diploma	5	3.00	1.14
H.S. Graduate/GED	59	2.61	1.02
Voc Technical	28	2.11	.87
Some College	30	2.53	1.07
College Graduate	55	2.42	1.08
Graduate Work	56	2.32	.90

[a]Perception scale was: 0 = no opinion; 1 = strongly disagree; 2 = disagree; 3 = neutral/not sure; 4 = agree; and 5 = strongly agree.

Note: Parents'/guardians' level of education was broken down into six categories: less than high school diploma, graduated from high school or high school equivalent (GED), vocational/technical training after high school, some college but didn't graduate, college graduate (bachelor's degree) and graduate work (beyond bachelor's degree).

Current Career Perceptions Based on High School Course of Study

Table 18 describes PGSAS program participants' current perceptions regarding careers in or related to food, agriculture and natural resources by their high school course of study. Several differences were apparent regarding participants' perceptions of the outlook for agricultural careers based on their high school curriculum. PGSAS program participants enrolled in the vocational/college preparatory curriculum (M = 1.43) in high school tended to disagree to a greater extent with the statement that most agriculture-related careers are in farming than participants enrolled in the general preparatory curriculum (M = 2.06). Program participants enrolled in the vocational/college preparatory curriculum (M = 1.57) also tended to disagree slightly more that there is limited opportunity for advancement for people employed in agriculture-related careers than did participants enrolled in the general preparatory curriculum (M = 2.06). Program participants enrolled in the general preparatory curriculum (M = 2.75) tended to be neutral or not sure about the statement that most agriculture-related careers require considerable knowledge of farms and farming. Conversely, participants who were enrolled in the college preparatory curriculum (M = 2.26) tended to disagree with the statement. Program participants enrolled in the vocational/college preparatory curriculum (M = 1.75) tended to be more positive toward the statement that the number of job opportunities in agriculture-related careers is declining than were participants enrolled in the general preparatory curriculum (M = 2.50). Program participants enrolled in the general preparatory curriculum (M = 3.38) tended to agree that most agriculture-related careers require considerable knowledge of farms and farming as compared to participants enrolled in the vocational/college preparatory curriculum (M = 2.68) who tended to be neutral toward the statement.

In regard to career alternatives related to agriculture, program participants enrolled in the college preparatory curriculum (M = 1.90) tended to disagree to a greater extent that most agriculture-related careers not in farming are in the sales of farm equipment and

Table 18. Current Perceptions of Program Respondents of the Pennsylvania Governor's School for the Agricultural Sciences (PGSAS) Regarding Careers in or Related to Food, Agriculture and Natural Resources Based on Their High School Course of Study.

Category, Perception Statement And High School Course Of Study	N	M[a]	S.D.
Outlook for Agricultural Careers			
Most Ag Careers are Farming			
General	16	2.06	.77
College Preparatory	177	1.58	.73
Vocational	4	1.50	.58
Vocational/College	28	1.43	.74
Other	4	1.25	.50
Limited Advancement in Ag Careers			
General	16	2.06	.68
College Preparatory	178	1.98	.78
Vocational	4	3.00	1.15
Vocational/College	28	1.57	.79
Other	4	1.75	1.50
Ag Careers Require Knowledge of Farming			
General	16	2.75	.86
College Preparatory	178	2.26	.95
Vocational	4	2.75	.96
Vocational/College	28	2.50	1.04
Other	4	2.00	.82
Number Of Ag Jobs is Declining			
General	16	2.50	.73
College Preparatory	178	2.15	.84
Vocational	4	3.00	1.41
Vocational/College	28	1.75	.93
Other	4	1.50	1.29
Most Ag Careers Require Graduate Education			
General	16	3.38	.96
College Preparatory	177	2.95	1.08
Vocational	4	2.00	1.63
Vocational/College	28	2.68	1.16
Other	4	2.50	1.29
Ag Careers Other Than in Farming are in Farm Equipment Sales			
General	16	2.44	.73
College Preparatory	177	1.90	.93
Vocational	4	2.50	.58
Vocational/College	28	2.36	1.16
Other	4	1.00	.82

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Table 18 (continued)

Category, Perception Statement And High School Course Of Study	N	M[a]	S.D.
Ag Careers Equal Others in Level of Prestige			
General	16	2.81	.91
College Preparatory	178	2.33	1.02
Vocational	4	1.50	1.00
Vocational/College	27	2.26	1.16
Other	4	1.25	.48
Working Environment in Agriculture			
Require Manual Labor			
General	16	2.50	1.03
College Preparatory	177	1.89	.75
Vocational	4	2.75	.50
Vocational/College	28	2.18	1.19
Other	4	1.50	.58
Scope of Agriculture			
Ag Careers Insecure -- Ag Economy Fluctuates			
General	16	2.25	.77
College Preparatory	178	2.17	.94
Vocational	4	2.25	.50
Vocational/College	28	1.61	.83
Other	4	1.25	1.26

[a]Perception scale was: 0 = no opinion; 1 = strongly disagree; 2 = disagree; 3 = neutral/not sure; 4 = agree; and 5 = strongly agree.

supplies than did program participants enrolled in the vocational/college preparatory curriculum (M = 2.36). Program participants enrolled in the vocational/college preparatory curriculum (M = 2.26) tended to disagree with the statement that agricultural occupations generally are viewed with the same level of prestige by the general public as are other occupations than did participants enrolled in the general preparatory curriculum (M = 2.81) who tended to be neutral or not sure toward the statement.

Program participants enrolled in different high school curriculums had different perspectives as to the work environment associated with an agriculture-related career and also the scope of agriculture. Program participants enrolled in the college preparatory curriculum (M = 1.89) tended to disagree to a greater extent that most agriculture-related careers involve or require manual labor than did participants enrolled in the general preparatory curriculum (M = 2.50). Program participants enrolled in the vocational/college preparatory curriculum (M = 1.61) tended to disagree more with the statement that an agriculture-related career is not secure because the agricultural economy fluctuates than did program participants enrolled in a general preparatory curriculum (M = 2.25). There are no additional significant differences between PGSAS program participants' perceptions for the remaining 18 perception statements based on their high school course of study.

Current Career Perceptions Based on Agricultural Youth Organization Membership

Table 19 describes PGSAS program participants' current perceptions regarding careers in or related to food, agriculture and natural resources by their agricultural youth organization membership. In regard to preparation for careers in agriculture, program participants who belonged to FFA (M = 1.54) or were never a member of FFA or 4-H (M = 1.52) tended to disagree slightly more with the statement that most agriculture-related careers do not require education beyond high school than participants who were members of both FFA and 4-H (M = 2.00).

Table 19. Current Perceptions of Program Respondents of the Pennsylvania Governor's School for the Agricultural Sciences (PGSAS) Regarding Careers in or Related to Food, Agriculture and Natural Resources Based on Their Agricultural Youth Organization Membership.

Category, Perception Statement And Agricultural Youth Organization Membership	N	M[a]	S.D.
Preparation for Careers in Agriculture			
Most Require no Education Beyond High School			
FFA	26	1.54	.81
4-H	37	1.76	.92
Both FFA & 4-H	19	2.00	1.00
Never FFA or 4-H	145	1.52	.64
Outlook for Agricultural Careers			
Most Ag Careers are Farming			
FFA	26	1.19	.40
4-H	38	1.79	.78
Both FFA & 4-H	19	1.74	.87
Never FFA or 4-H	144	1.60	.74
Ag Careers Require Knowledge of Farming			
FFA	26	2.27	1.12
4-H	38	2.32	.90
Both FFA & 4-H	19	2.95	1.13
Never FFA or 4-H	145	2.26	.90
Most Ag Careers Require Graduate Education			
FFA	26	2.65	1.32
4-H	38	3.05	1.06
Both FFA & 4-H	19	2.37	1.01
Never FFA or 4-H	144	3.01	1.08
Ag Careers Other Than in Farming are in Farm Equipment Sales			
FFA	26	2.19	1.67
4-H	38	2.10	.98
Both FFA & 4-H	19	2.53	1.02
Never FFA or 4-H	144	1.85	.91
Working Environment in Agriculture			
Require Manual Labor			
FFA	26	2.00	.94
4-H	37	2.05	1.05
Both FFA & 4-H	19	2.58	1.12
Never FFA or 4-H	145	1.87	.70

(continued on next page)

Table 19 (continued)

Category, Perception Statement And Agricultural Youth Organization Membership	N	M[a]	S.D.
People Choose Ag Careers to be Own Boss			
FFA	26	2.35	1.09
4-H	38	2.60	1.00
Both FFA & 4-H	19	3.00	1.05
Never FFA or 4-H	144	2.65	1.05
Scope of Agriculture			
Ag Careers Insecure -- Ag Economy Fluctuates			
FFA	26	1.58	.70
4-H	38	2.08	.97
Both FFA & 4-H	19	2.10	.88
Never FFA or 4-H	145	2.19	.97
Ag Careers Rarely Affected by World Events			
FFA	26	2.08	1.20
4-H	38	1.74	.92
Both FFA & 4-H	19	1.47	.61
Never FFA or 4-H	145	1.77	.86
Ag Careers Depend on Weather			
FFA	26	2.15	.92
4-H	38	2.60	1.15
Both FFA & 4-H	19	2.89	1.29
Never FFA or 4-H	145	2.42	.91

[a]Perception scale was: 0 = no opinion; 1 = strongly disagree; 2 = disagree; 3 = neutral/not sure; 4 = agree; and 5 = strongly agree.

In the terms of outlook for agricultural careers, program participants who belonged to FFA (M = 1.19) tended to disagree to a greater extent than participants who were 4-H members (M = 1.79) with the statement that most agriculture-related careers are in farming. Program participants who were never a member of FFA or 4-H (M = 2.26) tended to disagree with the statement that most agriculture-related careers require considerable knowledge of farms and farming whereas participants who were members of both FFA and 4-H (M = 2.95) tended to be neutral or not sure. Program participants who were in both FFA and 4-H (M = 2.37) tended to disagree with the statement that most agriculture-related careers require graduate-level education in fields such as genetics, microbiology and chemistry, whereas participants who were in 4-H (M = 3.05) tended to be neural or not sure. Program participants who were never a member of FFA or 4-H (M = 1.85) disagreed to a greater extent that most agriculture-related careers not in farming are in the sales of farm equipment and supplies than participants who were members of both FFA and 4-H (M = 2.53).

Regarding the working environment in agriculture, program participants who were never members of FFA or 4-H (M = 1.87) tended to disagree to a greater extent with the statement that most agriculture-related careers involve or require manual labor than participants who were members of both FFA and 4-H (M = 2.58). Program participants who were members of FFA (M = 2.35) tended to disagree with the statement that most people choose careers in agriculture because they can be their own bosses whereas participants who were members of both FFA and 4-H (M = 3.00) were neutral or not sure.

Program participants had different perspectives depending on their agricultural youth organization membership regarding the scope of the agricultural industry. Program participants who were members of FFA (M = 1.58) tended to be more positive than participants who were never a member of FFA or 4-H (M = 2.19) toward the statement that an agriculture-related career is not secure because the agricultural economy fluctuates.

Program participants who were members of both FFA and 4-H ($\underline{M}$ = 1.47) tended to disagree to a greater extent than participants who were only members of FFA ($\underline{M}$ = 2.08) with the statement that agricultural careers and career opportunities are rarely affected by world events. Program participants who were members of FFA ($\underline{M}$ = 2.15) tended to disagree with the statement that most careers in agriculture are dependent on weather conditions such as droughts and floods. Conversely, program participants who were members of both FFA and 4-H ($\underline{M}$ = 2.89) tended to be more neutral or not sure about the statement. There are no additional significant differences between PGSAS program participants' perceptions based on their agricultural youth organization membership for the remaining 17 perception statements.

Current Career Perceptions Based on Major Decision

For further analysis, the data were organized into four distinct categories reflecting program participants' responses to two questions regarding their intent to major in an agriculture or agriculture-related field. The following four categories were developed:

Change to Agriculture Major - PGSAS program participants who before attending Governor's School were not considering entering a major in or related to food, agriculture and natural resources but after attending Governor's School have considered entering a major in or related to food, agriculture and natural resources.

Change Away Agriculture Major -- PGSAS program participants who before attending Governor's School were considering entering a major in or related to food, agriculture and natural resources and who after attending Governor's School were no longer considering entering a major in or related to food, agriculture and natural resources.

No Change Agriculture Major -- PGSAS program participants who before and after attending Governor's School were considering entering a major in or related to food, agriculture and natural resources.

No Change to Agriculture Major -- PGSAS program participants who before and after attending Governor's School were not considering entering a major in or related to food, agriculture and natural resources.

Of the *change to agriculture major* group, twenty-two percent (22.5%) of the participants classified their residence as a city (Table 20). Eighty percent (80.6%) of the program participants in this group classified their residence as non-farm. In the *no change agriculture major* group, over one-third (35.0%) classified their residence as living on a farm. The majority of program participants in the *change to agriculture major* group classified their father's occupation (62.7%) and mother's occupation (52.2%) as professional/technical (Table 21).

Of the program participants classified as *change to agriculture major*, the majority were enrolled in the college preparatory program (92.5%) in high school and were A (83.5%) students (Table 22). Of the program participants classified as *no change agriculture major*, almost two-thirds were enrolled in the college preparatory program (64.4%) in high school and the majority were A students (72.9%).

Table 23 shows a comparison of program participants' current perceptions regarding careers in or related to food, agriculture and natural resources based on their major decision. Overall, program participants classified as either *change to agriculture major* or *no change agriculture major* tended to be more positive in their perceptions than the other two major decision groups. In regard to the outlook for agricultural careers, PGSAS program participants classified as *change to agriculture major* tended to agree (58.4%) more frequently than other major decision groups with the statement that college

Table 20. Sociodemographic Characteristics of Pennsylvania Governor's School for the Agricultural Sciences (PGSAS) Program Respondents Reported by Their Major Decision.

Variable	Major Decision							
	Change to Ag Major		Change Away Ag Major		No Change Ag Major		No Change to Ag Major	
	N	%	N	%	N	%	N	%
Gender								
Male	30	45.5	2	22.2	44	41.5	26	52.0
Female	36	54.5	7	77.8	62	58.5	24	48.0
	66	100.0	9	100.0	106	100.0	50	100.0
Race								
Black Afro-American	1	1.6	0	0.0	1	.9	1	2.0
Hispanic	0	0.0	0	0.0	1	.9	0	0.0
Oriental or Asian American	3	4.7	0	0.0	3	2.8	9	18.4
White or Anglo American	59	92.2	8	100.0	99	93.5	39	79.6
Other/Indian	1	1.6	0	0.0	2	1.9	0	0.0
	64	100.0	8	100.0	106	100.0	49	100.0
Residence								
Lg. Metropolitan City (>500,000)	6	9.0	2	22.2	8	7.8	2	4.0
Medium City (50,000 - 500,000)	4	6.0	1	11.1	2	1.9	3	6.0
Smaller City (20,000 - 49,999)	5	7.5	2	22.2	8	7.8	10	20.0
Suburbs	17	25.4	0	0.0	16	15.5	20	40.0
Town or Village (<10,000)	10	14.9	0	0.0	10	9.7	2	4.0
Country (Outside City or Village)	12	17.9	1	11.1	23	22.3	7	14.0
On a Farm	13	19.4	3	33.3	36	35.0	6	12.0
	67	100.0	9	99.9	103	100.0	50	100.0

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Table 20 (continued)

Variable	Major Decision: Change to Ag Major N	%	Change Away Ag Major N	%	No Change Ag Major N	%	No Change to Ag Major N	%

Note: The data were organized into four distinct categories reflecting program participants' responses to two questions regarding their intent to major in an agricultural or agriculture-related field in relationship to their Governor's School experience:
Change to Agriculture Major -- PGSAS program participants who before attending Governor's School were not considering entering a major in or related to food, agriculture and natural resources but after attending Governor's School have considered entering a major in or related to food, agriculture and natural resources.
Change Away Agriculture Major -- PGSAS program participants who before attending Governor's School were considering entering a major in or related to food, agriculture and natural resources and who after attending Governor's School were no longer considering entering a major in or related to food, agriculture and natural resources.
No Change Agriculture Major -- PGSAS program participants who before and after attending Governor's School were considering entering a major in or related to food, agriculture and natural resources.
No Change to Agriculture Major -- PGSAS program participants who before and after attending Governor's School were not considering entering a major in or related to food, agriculture and natural resources.

Table 21. Parents' Educational and Occupational Background of Pennsylvania Governor's School for the Agricultural Sciences (PGSAS) Program Respondents Reported by Their Major Decision.

Variable	Major Decision: Change to Ag Major N	%	Change Away Ag Major N	%	No Change Ag Major N	%	No Change to Ag Major N	%
Father's Education								
High School or Less	11	16.7	1	11.1	36	34.3	6	12.0
Postsecondary								
Including Bachelor's Degree	28	42.4	6	66.7	33	31.4	14	28.0
Beyond Bachelor's Degree	27	40.9	2	22.2	36	34.3	30	60.0
	66	100.0	9	100.0	105	100.0	50	100.0
Mother's Education								
High School or Less	13	19.4	2	22.2	35	33.0	12	24.0
Postsecondary								
Including Bachelor's Degree	34	50.7	6	66.7	53	50.0	21	42.0
Beyond Bachelor's Degree	20	29.9	1	11.1	18	17.0	17	34.0
	67	100.0	9	100.0	106	100.0	50	100.0
Father's Occupation								
Professional/Technical	42	62.7	3	33.3	43	41.3	29	59.2
Manager/Proprietor	7	10.4	2	22.2	27	26.0	11	22.4
Clerical/Sales/Blue Collar/Other	18	26.9	4	44.4	34	32.7	9	18.4
	67	100.0	9	99.9	104	100.0	49	100.0
Mother's Occupation								
Professional/Technical	35	52.2	6	66.7	27	25.7	24	49.0
Manager/Proprietor	3	4.5	1	11.1	5	4.8	3	6.1
Clerical/Sales/Blue Collar/Other	29	43.3	2	22.2	73	69.5	22	44.9
	67	100.0	9	100.0	105	100.0	49	100.0

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Table 21 (continued)

Variable	Major Decision: Change to Ag Major N	%	Change Away Ag Major N	%	No Change Ag Major N	%	No Change to Ag Major N	%

Note: The data were organized into four distinct categories reflecting program participants' responses to two questions regarding their intent to major in an agricultural or agriculture-related field in relationship to their Governor's School experience:
Change to Agriculture Major -- PGSAS program participants who before attending Governor's School were not considering entering a major in or related to food, agriculture and natural resources but after attending Governor's School have considered entering a major in or related to food, agriculture and natural resources.
Change Away Agriculture Major -- PGSAS program participants who before attending Governor's School were considering entering a major in or related to food, agriculture and natural resources and who after attending Governor's School were no longer considering entering a major in or related to food, agriculture and natural resources.
No Change Agriculture Major -- PGSAS program participants who before and after attending Governor's School were considering entering a major in or related to food, agriculture and natural resources.
No Change to Agriculture Major -- PGSAS program participants who before and after attending Governor's School were not considering entering a major in or related to food, agriculture and natural resources.

Parents'/guardians' level of education was defined as follows: high school or less -- parent/guardian who had less than high school diploma or who graduated from high school or had the high school equivalent (GED); postsecondary including bachelor's degree -- parent/guardian who had either vocational/technical training after high school, some college but didn't graduate, or college graduate (bachelor's degree); beyond bachelor's degree -- parent/guardian who did graduate work beyond the bachelor's degree.

Table 22. High School Program Information for Pennsylvania Governor's School for the Agricultural Sciences (PGSAS) Program Respondents Reported by Their Major Decision.

Variable	Major Decision: Change to Ag Major N	%	Change Away Ag Major N	%	No Change Ag Major N	%	No Change to Ag Major N	%
Course of Study in High School								
General	2	3.0	0	0.0	9	8.7	5	10.2
College Preparatory	62	92.5	8	88.9	67	64.4	39	79.6
Vocational	0	0.0	1	11.1	2	1.9	1	2.0
Vocational/College	1	1.5	0	0.0	26	25.0	2	4.1
Other	2	3.0	0	0.0	0	0.0	2	4.1
	67	100.0	9	100.0	104	100.0	49	100.0
High School Grade-Point Average								
A (4.00)	35	52.2	3	33.3	33	31.1	23	46.0
A- (3.67 - 3.99)	21	31.3	4	44.4	51	48.1	21	42.0
B+ (3.33 - 3.66)	7	10.5	0	0.0	16	15.1	5	10.0
B (3.00 - 3.32)	4	6.0	2	22.2	5	4.7	1	2.0
B- (2.67 - 2.99)	0	0.0	0	0.0	1	.9	0	0.0
	67	100.0	9	99.9	106	99.9	50	100.0
Agricultural Youth Organization Membership								
FFA	4	6.1	1	11.1	19	18.4	2	4.1
4-H	10	15.2	2	22.2	19	18.4	6	12.3
Both FFA & 4-H	0	0.0	0	0.0	17	16.5	1	2.0
Never FFA or 4-H	52	78.8	6	66.7	48	46.6	40	81.6
	66	100.0	9	100.0	103	99.9	49	100.0

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Table 22 (continued)

Variable	Major Decision: Change to Ag Major N	%	Change Away Ag Major N	%	No Change Ag Major N	%	No Change to Ag Major N	%
Class of PGSAS								
1986	6	9.0	3	33.3	14	13.2	14	28.0
1987	13	19.4	2	22.2	22	20.8	9	18.0
1988	17	25.4	2	22.2	22	20.8	6	12.0
1989	13	19.4	1	11.1	23	21.7	12	24.0
1990	18	26.8	1	11.1	25	23.5	9	18.0
	67	100.0	9	99.9	106	100.0	50	100.0

Note: The data were organized into four distinct categories reflecting program participants' responses to two questions regarding their intent to major in an agricultural or agriculture-related field in relationship to their Governor's School experience:
Change to Agriculture Major -- PGSAS program participants who before attending Governor's School were not considering entering a major in or related to food, agriculture and natural resources but after attending Governor's School have considered entering a major in or related to food, agriculture and natural resources.
Change Away Agriculture Major -- PGSAS program participants who before attending Governor's School were considering entering a major in or related to food, agriculture and natural resources and who after attending Governor's School were no longer considering entering a major in or related to food, agriculture and natural resources.
No Change Agriculture Major -- PGSAS program participants who before and after attending Governor's School were considering entering a major in or related to food, agriculture and natural resources.
No Change to Agriculture Major -- PGSAS program participants who before and after attending Governor's School were not considering entering a major in or related to food, agriculture and natural resources.

Table 23. Current Perceptions of Program Respondents of the Pennsylvania Governor's School for the Agricultural Sciences (PGSAS) Regarding Careers in or Related to Food, Agriculture and Natural Resources Reported by Their Major Decision.

Category, Perception Statement And Major Decision	N	Perception Response Option: Strongly Disagree %	Disagree %	Neutral %	Agree %	Strongly Agree %
Preparation for Careers in Agriculture						
Most Colleges of Ag are Vocational						
Change to Ag Major	64	34.4	34.4	21.9	7.8	1.5
Change Away Ag Major	9	33.3	11.1	44.4	11.1	–
No Change Ag Major	101	32.7	36.6	28.7	1.0	1.0
No Change to Ag Major	48	20.8	43.8	31.2	4.2	–
Most Ag Colleges Located in Midwest						
Change to Ag Major	67	23.9	41.8	32.8	1.5	–
Change Away Ag Major	9	11.1	44.4	33.3	11.1	–
No Change Ag Major	104	18.3	50.0	28.8	2.9	–
No Change to Ag Major	48	4.2	50.0	39.6	6.2	–
Most Require no Education Beyond High School						
Change to Ag Major	65	55.4	40.0	–	4.6	–
Change Away Ag Major	9	55.6	44.4	–	–	–
No Change Ag Major	104	46.2	44.2	4.8	2.9	1.9
No Change to Ag Major	49	46.9	53.1	–	–	–

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Table 23 (continued)

Category, Perception Statement And Major Decision	N	Perception Response Option: Strongly Disagree %	Disagree %	Neutral %	Agree %	Strongly Agree %
Outlook for Agricultural Careers						
Ag Grad Salaries are as High as Other Graduates						
Change to Ag Major	65	1.5	7.7	32.4	44.6	13.8
Change Away Ag Major	9	–	11.1	44.4	22.2	22.2
No Change Ag Major	102	1.0	21.6	22.5	43.1	11.8
No Change to Ag Major	48	–	25.0	35.4	29.2	10.4
Most Ag Careers are Farming						
Change to Ag Major	66	53.0	37.9	7.6	1.5	–
Change Away Ag Major	9	66.7	22.2	–	11.1	–
No Change Ag Major	104	52.9	40.4	3.8	2.9	–
No Change to Ag Major	49	46.9	40.8	8.2	4.1	–
Need Farm Experience to Enter Ag Career						
Change to Ag Major	66	62.2	31.8	3.0	3.0	–
Change Away Ag Major	9	66.7	11.1	–	22.2	–
No Change Ag Major	104	64.4	29.8	1.0	2.9	1.9
No Change to Ag Major	49	59.2	38.8	2.0	–	–
Limited Advancement in Ag Careers						
Change to Ag Major	66	27.3	51.5	16.7	4.5	–
Change Away Ag Major	9	22.2	55.6	11.1	11.1	–
No Change Ag Major	105	31.4	58.1	6.7	3.8	–
No Change to Ag Major	49	24.5	34.7	32.6	8.2	–

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Table 23 (continued)

Category, Perception Statement And Major Decision	N	Perception Response Option: Strongly Disagree %	Disagree %	Neutral %	Agree %	Strongly Agree %
Ag Careers Require Knowledge of Farming						
Change to Ag Major	67	22.4	53.8	13.4	10.4	–
Change Away Ag Major	9	11.1	55.6	–	33.3	–
No Change Ag Major	105	13.3	49.5	21.9	12.4	2.9
No Change to Ag Major	49	16.3	44.9	22.5	16.3	–
Number of Ag Jobs is Declining						
Change to Ag Major	67	25.4	46.3	23.8	3.0	1.5
Change Away Ag Major	9	11.1	77.8	–	11.1	–
No Change Ag Major	105	27.6	42.9	24.7	2.9	1.9
No Change to Ag Major	48	20.8	29.2	47.9	2.1	–
Most Ag Careers Require Graduate Education						
Change to Ag Major	67	7.5	31.3	34.3	20.9	6.0
Change Away Ag Major	9	–	55.6	11.1	22.2	11.1
No Change Ag Major	102	7.8	32.4	22.6	29.4	7.8
No Change to Ag Major	48	4.2	18.7	39.5	31.3	6.3
Ag Careers Other Than in Farming are in Farm Equipment Sales						
Change to Ag Major	64	48.4	34.4	10.9	6.3	–
Change Away Ag Major	9	11.1	55.6	22.2	11.1	–
No Change Ag Major	105	26.7	49.5	11.4	11.4	1.0
No Change to Ag Major	48	27.1	47.9	14.6	8.3	2.1

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Table 23 (continued)

Category, Perception Statement And Major Decision	N	Perception Response Option: Strongly Disagree %	Disagree %	Neutral %	Agree %	Strongly Agree %
Ag Careers Equal Others in Level of Prestige						
Change to Ag Major	66	18.2	51.5	16.7	12.1	1.5
Change Away Ag Major	9	11.1	77.8	–	–	11.1
No Change Ag Major	101	16.8	47.5	12.9	21.8	1.0
No Change to Ag Major	48	8.3	58.3	18.8	12.5	2.1
Working Environment in Agriculture						
Not Attractive to Females						
Change to Ag Major	65	38.5	41.5	12.3	4.6	3.1
Change Away Ag Major	9	33.3	66.7	–	–	–
No Change Ag Major	104	52.9	37.5	7.7	1.9	–
No Change to Ag Major	46	26.1	54.3	10.9	8.7	–
Often Work in Urban Areas						
Change to Ag Major	65	3.1	18.5	41.5	33.8	3.1
Change Away Ag Major	9	–	44.4	22.2	33.3	–
No Change Ag Major	105	4.8	26.7	26.7	37.0	4.8
No Change to Ag Major	47	4.3	21.3	27.6	40.4	6.4
Involve Work Outdoors						
Change to Ag Major	67	10.4	53.8	22.4	13.4	–
Change Away Ag Major	9	11.1	44.4	44.4	–	–
No Change Ag Major	104	5.8	56.7	25.0	12.5	–
No Change to Ag Major	49	8.2	55.1	24.5	12.2	–

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Table 23 (continued)

Category, Perception Statement And Major Decision	N	Perception Response Option: Strongly Disagree %	Disagree %	Neutral %	Agree %	Strongly Agree %
Require Manual Labor						
Change to Ag Major	67	41.8	43.3	11.9	3.0	–
Change Away Ag Major	9	11.1	77.8	11.1	–	–
No Change Ag Major	103	22.3	52.4	10.7	14.6	–
No Change to Ag Major	49	26.6	61.2	10.2	2.0	–
Not Attractive to Minorities						
Change to Ag Major	61	23.0	45.9	24.6	4.9	1.6
Change Away Ag Major	9	22.2	55.6	11.1	11.1	–
No Change Ag Major	98	27.6	41.8	22.4	8.2	–
No Change to Ag Major	47	10.6	46.8	34.0	4.3	4.3
People Choose Ag Careers to be Own Boss						
Change to Ag Major	64	–	39.1	45.3	15.6	–
Change Away Ag Major	8	–	50.0	25.0	25.0	–
No Change Ag Major	99	5.1	34.3	35.3	25.3	–
No Change to Ag Major	44	9.1	22.6	45.5	20.5	2.3
Career Alternatives						
Ag Graduates Often Pursue Business Careers						
Change To Ag Major	66	–	9.1	39.3	45.5	6.1
Change Away Ag Major	9	11.1	11.1	44.4	33.3	–
No Change Ag Major	103	1.0	6.8	35.0	50.4	6.8
No Change To Ag Major	47	–	4.3	42.6	42.6	10.5

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Table 23 (continued)

Category, Perception Statement And Major Decision	N	Perception Response Option: Strongly Disagree %	Disagree %	Neutral %	Agree %	Strongly Agree %
Ag Graduates are Desired by Multinational Companies						
Change to Ag Major	66	–	3.0	19.8	42.4	34.8
Change Away Ag Major	9	–	–	44.4	33.3	22.2
No Change Ag Major	104	1.9	1.9	26.0	55.8	14.4
No Change to Ag Major	48	–	2.1	31.3	52.1	14.5
Ag Graduates are Able to Pursue Science Career						
Change to Ag Major	67	–	–	1.5	56.7	41.8
Change Away Ag Major	9	–	–	–	77.8	22.2
No Change Ag Major	105	1.0	1.0	6.5	61.0	30.5
No Change to Ag Major	49	–	2.0	4.2	67.3	26.5
Ag Grads Lack Skills for Other Careers						
Change to Ag Major	65	44.6	47.7	6.2	1.5	–
Change Away Ag Major	9	33.3	66.7	–	–	–
No Change Ag Major	105	41.9	49.5	8.6	–	–
No Change to Ag Major	49	26.5	61.2	8.3	2.0	2.0
Science Graduates can find Ag Careers						
Change to Ag Major	67	–	–	3.0	50.7	46.3
Change Away Ag Major	9	–	–	11.1	66.7	22.2
No Change Ag Major	104	–	–	3.8	63.5	32.7
No Change to Ag Major	49	–	–	2.0	71.5	26.5

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Table 23 (continued)

Category, Perception Statement And Major Decision	N	Perception Response Option: Strongly Disagree %	Disagree %	Neutral %	Agree %	Strongly Agree %
Business Graduates can find Agribusiness Careers						
Change to Ag Major	66	–	–	1.5	66.7	31.8
Change Away Ag Major	9	–	–	–	88.9	11.1
No Change Ag Major	104	–	–	7.6	71.2	21.2
No Change to Ag Major	49	–	2.0	10.3	71.4	16.3
Scope of Agriculture						
Ag Careers Insecure -- Ag Economy Fluctuates						
Change to Ag Major	67	28.4	43.2	22.4	4.5	1.5
Change Away Ag Major	9	22.2	44.4	22.2	11.1	–
No Change Ag Major	104	29.8	45.2	17.3	7.7	–
No Change to Ag Major	47	19.2	44.7	23.4	10.6	2.1
Ag Careers Rarely Affected by World Events						
Change to Ag Major	67	34.3	47.8	14.9	–	3.0
Change Away Ag Major	9	44.4	22.2	33.3	–	–
No Change Ag Major	101	40.6	46.5	7.9	3.0	2.0
No Change to Ag Major	48	43.8	43.8	6.2	6.2	–
Ag Careers Depend on Weather						
Change to Ag Major	65	12.3	49.2	21.5	16.9	–
Change Away Ag Major	9	–	77.8	–	22.2	–
No Change Ag Major	103	12.6	46.6	19.4	20.4	1.0
No Change to Ag Major	48	10.3	50.0	18.8	18.8	2.1

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Table 23 (continued)

Category, Perception Statement And Major Decision	N	Perception Response Option: Strongly Disagree %	Disagree %	Neutral %	Agree %	Strongly Agree %

Note: The data were organized into four distinct categories reflecting program participants' responses to two questions regarding their intent to major in an agricultural or agriculture-related field in relationship to their Governor's School experience:
Change to Agriculture Major -- PGSAS program participants who before attending Governor's School were not considering entering a major in or related to food, agriculture and natural resources but after attending Governor's School have considered entering a major in or related to food, agriculture and natural resources.
Change Away Agriculture Major -- PGSAS program participants who before attending Governor's School were considering entering a major in or related to food, agriculture and natural resources and who after attending Governor's School were no longer considering entering a major in or related to food, agriculture and natural resources.
No Change Agriculture Major -- PGSAS program participants who before and after attending Governor's School were considering entering a major in or related to food, agriculture and natural resources.
No Change to Agriculture Major -- PGSAS program participants who before and after attending Governor's School were not considering entering a major in or related to food, agriculture and natural resources.

graduates who major in agriculture and agriculture-related majors earn salaries as high as those earned by graduates in most other areas. Program participants who were classified as *no change agriculture major* tended to disagree (89.5%) more frequently than other major decision groups with the statement that there is limited opportunity for advancement for people employed in agriculture-related careers. The majority of all major decision groups also disagreed with that statement, however, less frequently. The group who did not indicate a change away from an agriculture major tended to be the most optimistic regarding advancement opportunities in agriculture. Ninety percent (89.5%) disagreed with the statement that there is limited opportunity for advancement for people employed in agriculture-related careers. Participants classified as *change to agriculture major* and *no change agriculture major* tended to be more positive regarding the number of job opportunities in agriculture than participants classified as *no change to agriculture major*. Participants classified as *change to agriculture major* (71.7%) and *no change agriculture major* (70.5%) tended to disagree more frequently with the statement that the number of job opportunities in agriculture-related careers is declining. No additional differences were apparent among participants and the remaining 24 perception statements when major decision was considered.

Participants' Statements Regarding New Knowledge About Career Opportunities Related to Agriculture

Relative to new knowledge or information gained regarding careers in food, agriculture and natural resources during PGSAS, program participants wrote that they discovered the breadth and multiplicity of careers in agriculture. A total of 242 specific comments were written by program participants regarding the role of agriculture and the many career opportunities available. The written comments reflected program participants'

new awareness of the link between science and agriculture and the importance of agriculture to state and national economies.

PGSAS participants reported using this new knowledge to select a college major and career, to educate others about the importance of agriculture and the diversity of agricultural careers, and in their daily lives. In their use of this new knowledge, program participants specifically identified teachers, peers and parents as audiences they educated regarding agriculture. With regard to their use of this new knowledge in their personal daily life, they specifically reported that it improved their school work, gave them a broader perspective and provided a basis for a greater respect regarding the role of agriculture.

Participants' Statements Regarding New Knowledge
About Educational Opportunities Related to Agriculture

Relative to new knowledge or information gained regarding educational opportunities in food, agriculture and natural resources during PGSAS, program participants wrote that they discovered the many and varied educational opportunities available in a college of agriculture and at Penn State's College of Agriculture. Specifically the 150 responses reflected they were more knowledgeable regarding the diversity of agricultural majors and the fairly demanding curriculum requirements. Program participants indicated they also became much more aware of research opportunities, the extent of agricultural research conducted, and available opportunities to work with faculty in research laboratories.

PGSAS participants also reported using this information in planning and/or choosing a college, exploring majors/minors available, to educate others about agriculture and in their daily lives. Specifically the program participants reported using the information in surviving in college, helping fellow students and being more open to and respectful of the agriculture industry.

Influences on Choice of College Major

Individuals and Experiences Influencing Choice of College Major

PGSAS program participants reported information for the following individuals and experiences relative to the degree of influence the factor had on their choice of a college major (Table 24). The PGSAS experience (M = 2.11) had the most influence, father (M = 2.05) had the second most influence, and the mother (M = 2.04) was the third most important influence. It must be emphasized that these mean values for the three most important factors reflect some degree of influence in choosing a college major. Individuals having a lower degree of influence included persons employed in the profession, high school and college personnel, and friends and relatives.

It was decided to examine the relative level of influence from the perspective of the PGSAS participants' background, specifically in terms of the variables residence, high school course of study, membership in selected agricultural youth organizations and parents' educational level serving as a proxy measure of socioeconomic status. The following sections report information related to that more detailed examination of choice of a college major. A .5 differential between the mean scores was established as the criterion to determine if there were substantial differences in the influences.

Individuals and Experiences Influencing Choice of College Major Based on Residence Status

Table 25 describes the relative influence of individuals and experiences on PGSAS program participants' choice of a college major by their residence status. The PGSAS experience tended to have a greater influence on choice of a college major for program participants who lived most of their life in the country but not on a farm (M = 2.49), especially as compared to program participants who lived in a metropolitan city (M = 1.80)

Table 24. Individuals and Experiences Influencing Pennsylvania Governor's School for the Agricultural Sciences (PGSAS) Program Respondents' Choice of College Major.

Influence Ranked by Mean	N	Mean[a]	S.D.
PGSAS	225	2.11	.78
Father	229	2.05	.64
Mother	228	2.04	.65
Person Employed in the Profession	215	1.80	.76
High School Teacher	226	1.74	.77
College Professor	210	1.56	.71
Friend	224	1.53	.63
College Admission Personnel	217	1.52	.70
Relative	213	1.41	.63
High School Counselor	229	1.39	.61
Sibling	212	1.36	.58
High School Administrator	224	1.15	.42
Minister/Priest/Rabbi	202	1.05	.24

[a]Influence scale was: 0 = not applicable/available; 1 = no influence; 2 = some influence; and 3 = strong influence.

Table 25. Importance of Selected Individuals and Experiences Influencing Pennsylvania Governor's School for the Agricultural Sciences (PGSAS) Program Respondents' Choice of College Major Based on Their Residence Status.

Influence Factor and Place of Residence	N	M[a]	S.D.
PGSAS			
Lg. Metropolitan City (>500,000)	15	1.80	.86
Medium City (50,000 - 500,000)	10	2.00	.82
Smaller City (20,000 - 49,999)	22	1.90	.81
Suburbs	53	1.85	.72
Town or Village (<10,000)	22	2.14	.83
Country (Outside City or Village)	43	2.49	.74
On a Farm	57	2.19	.72
Mother			
Lg. Metropolitan City (>500,000)	17	2.29	.69
Medium City (50,000 - 500,000)	10	1.90	.32
Smaller City (20,000 - 49,999)	24	1.71	.55
Suburbs	52	1.88	.70
Town or Village (<10,000)	22	2.10	.61
Country (Outside City or Village)	43	2.14	.68
On a Farm	57	2.16	.62
High School Teacher			
Lg. Metropolitan City (>500,000)	16	1.75	.86
Medium City (50,000 - 500,000)	10	1.30	.48
Smaller City (20,000 - 49,999)	24	1.54	.66
Suburbs	52	1.75	.74
Town or Village (<10,000)	21	1.71	.90
Country (Outside City or Village)	42	1.86	.81
On a Farm	59	1.81	.78

[a]Influence scale was: 0 = not applicable/available; 1 = no influence; 2 = some influence; and 3 = strong influence.

most of their life. Mothers of program participants from a metropolitan city (M = 2.29) tended to influence choice of college major to a greater extent than participants who resided in a smaller city with a population of 20,000 to 49,999 (M = 1.71). High school teachers tended to have a greater influence on program participants choice of a college major if they either lived in the country (M = 1.86) or on a farm (M = 1.81) most of their life than participants who were from a medium-sized city (M = 1.30). Yet, this still represented a relatively low level of influence. Based on residence status, there were no differences found between program participants' influence ratings regarding choice of a college major for their fathers or persons employed in the profession.

Individuals and Experiences Influencing Choice of College Major Based on High School Course of Study

Table 26 describes the relative influence of individuals and experiences on PGSAS program participants' choice of a college major by the type of high school curriculum. The PGSAS experience tended to influence program participants enrolled in the vocational/ college preparatory high school curriculum (M = 2.41) choice of a college major to a greater extent than participants enrolled in the high school general curriculum (M = 1.69). A similar trend existed for the influence of high school teachers on the participants' choice of a major. High school teachers tended to influence program participants in the high school vocational/college preparatory curriculum (M = 2.14) choice of college major to a much greater degree than program participants enrolled in the high school general curriculum. There were no differences found between program participants' influence ratings regarding choice of a college major for their fathers, mothers or persons employed in the profession based on their high school course of study.

Individuals and Experiences Influencing Choice of College Major Based on Agricultural Youth Organization Membership

The rationale for examining differences relative to youth organization membership was that school personnel, specifically the high school teacher, may be more influential for persons involved with FFA. Table 27 describes the relative influence of individuals and experiences on choice of a college major by PGSAS participants' agricultural youth organization membership.

Table 26. Importance of Selected Individuals and Experiences Influencing Pennsylvania Governor's School for the Agricultural Sciences (PGSAS) Program Respondents' Choice of College Major Based on Their High School Course of Study.

Influence Factor and Curriculum Studied in High School	N	M[a]	S.D.
PGSAS			
General	16	1.69	.60
College Preparatory	171	2.10	.79
Vocational/College	26	2.41	.75
High School Teacher			
General	16	1.19	.40
College Preparatory	171	1.71	.76
Vocational/College	29	2.40	.83

[a]Influence scale was: 0 = not applicable/available; 1 = no influence; 2 = some influence; and 3 = strong influence.

The PGSAS experience tended to influence program participants' choice of a college major who were members of FFA (M = 2.48) to a greater extent than participants who were never a member of FFA or 4-H (M = 1.99). The influence of PGSAS for the FFA member approached a level of strong influence for those who reported FFA membership or a combination of FFA and 4-H membership.

The same relative trend emerged for the influence of persons employed in the profession and the influence of the high school teacher. However, the relative level of influence was at a slightly lower level than for the influence of PGSAS. Persons employed

Table 27. Importance of Selected Individuals and Experiences Influencing Pennsylvania Governor's School for the Agricultural Sciences (PGSAS) Program Respondents' Choice of College Major Based on Their Agricultural Youth Organization Membership.

Influence Factor and Membership in Agricultural Youth Organization	N	M[a]	S.D.
PGSAS			
FFA	25	2.48	.65
4-H	38	2.21	.70
Both FFA & 4-H	17	2.41	.71
Never FFA or 4-H	140	1.99	.80
Person Employed in the Profession			
FFA	23	2.17	.77
4-H	37	1.92	.72
Both FFA & 4-H	18	2.17	.62
Never FFA or 4-H	132	1.65	.75
High School Teacher			
FFA	26	2.19	.75
4-H	36	1.67	.76
Both FFA & 4-H	18	2.17	.86
Never FFA or 4-H	141	1.63	.72

[a]Influence scale was: 0 = not applicable/available; 1 = no influence; 2 = some influence; 3 = strong influence.

in the profession tended to have a greater influence on participants' choice of college major if they were members of FFA (M = 2.17) or FFA and 4-H (M = 2.17) than if they had never been a member of FFA and 4-H (M = 1.65). Program participants who were either in FFA (M = 2.19) or both FFA and 4-H (M = 2.17) choice of a college major tended to be influenced to a greater degree by a high school teacher than participants who were only a 4-H member (M = 1.67) or never had been a FFA or 4-H member (M = 1.63). There were no differences found between program participants' influence ratings regarding choice of college major for their father or mother based on their agricultural youth organization membership.

Personal Factors Influencing Choice of College Major

In addition to examining individuals and experiences that influenced a PGSAS program participants' choice of a college major, the investigator also examined personal factors that may have had an influence on their decision. The personal factors explored tended to have a greater influence on participants than the individuals and experiences previously explored.

PGSAS program participants rated the following four factors in order of importance as having a strong influence on their choice of a college major (Table 28). Personal interests (M = 2.91) ranked first, personal happiness (M = 2.84) ranked second, personal ability and skills (M = 2.78) ranked third and career interests (M = 2.76) ranked fourth. Other factors that had some influence included: use of special talents, creativity and originality, experience, job availability, prestige, and potential salary, and difficulty of program.

Table 28. Personal Factors Influencing Program Respondents of the Pennsylvania Governor's School for the Agricultural Sciences (PGSAS) Choice of College Major.

Personal Factor Ranked by Mean	N	Mean[a]	S.D.
Personal Interests	232	2.91	.28
Personal Happiness	232	2.84	.40
Personal Ability And Skills	232	2.78	.42
Career Interests	232	2.76	.47
Use Of Special Talents	232	2.26	.67
Availability Of Jobs	232	2.17	.68
Use Of Creativity And Originality	232	2.12	.66
Difficulty Of Course/ Program Of Study	231	1.90	.63
Possible Salary After College	231	1.89	.68
Past Work Experience	216	1.74	.81
Prestige Of Career Major	231	1.71	.65

[a]Personal factor scale was: 1 = not important; 2 = somewhat important; and 3 = very important.

Personal Factors Influencing Choice of College Major Based on Residence Status

The rationale for examining differences relative to residence status was that participants from a farm may have had more exposure to agriculture-related careers than participants from urban areas. Table 29 describes the relative influence of selected personal factors influencing PGSAS program participants' choice of a college major and their place of residence. Personal ability and skills had a greater influence on choice of a college major for program participants who either lived in a large metropolitan city (M = 2.82), suburbs or on a farm (M = 2.81) than for participants who lived in a medium size city most of their life (M = 2.30). Use of special talents had a greater influence on choice of a college major for program participants who lived in a town or village (M = 2.41) as opposed to those who lived in a medium size city (M = 1.90). There were no differences found between program participants ratings of personal factors regarding choice of college major for personal interests, personal happiness or career interests based on residence. Nor were there any differences in ratings of personal factors based on program participants' gender, parents'/guardians' education, high school course of study or agricultural youth organization membership.

Individuals and Experiences Influencing Choice of College Major Based on Major Decision

The rationale for examining differences relative to the major decision was that some experiences and individuals may have had more of an effect on program participants who were considering an agriculture major after their Governor's School experience. PGSAS program participants who were not considering an agriculture-related major prior to their Governor's School experience but were afterwards (*change to agriculture major*) reported in order of importance PGSAS (M = 2.33), mother (M = 2.09) and father (M = 2.00) as

Table 29. Selected Personal Factors Influencing Pennsylvania Governor's School for the Agricultural Sciences (PGSAS) Program Respondents' Choice of College Major Based on Residence Status.

Personal Factor and Place of Residence	N	M[a]	S.D.
Personal Ability And Skills			
Lg. Metropolitan City (>500,000)	17	2.82	.39
Medium City (50,000 - 500,000)	10	2.30	.48
Smaller City (10,000 - 49,000)	25	2.76	.44
Suburbs	53	2.81	.39
Town or Village (<10,000)	22	2.73	.46
Country (Outside City or Village)	43	2.79	.41
On a Farm	59	2.81	.39
Use Of Special Talents			
Lg. Metropolitan City (>500,000)	17	2.29	.77
Medium City (50,000 - 500,000)	10	1.90	.74
Smaller City (10,000 - 49,000)	25	2.12	.67
Suburbs	53	2.30	.72
Town or Village (<10,000)	22	2.41	.59
Country (Outside City or Village)	43	2.28	.63
On a Farm	59	2.22	.62

[a]Personal factor scale was: 1 = not important; 2 = somewhat important; and 3 = very important.

the three most influential experiences or persons in their choice of a college major (Table 30). PGSAS program participants who were considering an agricultural major both before and after their Governor's School experience (*no change agriculture major*) identified PGSAS (M = 2.27), father (M = 2.10), mother (M = 2.06), person employed in the profession (M = 2.01) and high school teacher (M = 1.83) in the same order of importance as the overall population. However, each influence factor was slightly more influential for this group of participants when compared with the overall population. PGSAS program participants who were not considering an agriculture career before or after their Governor's School experience (*no change to agriculture major*) reported father (M = 2.02) as the most influential individual in their choice of college major and PGSAS (M = 1.48) was fifth most important.

Personal Factors Influencing Choice of College Major Based on Major Decision

PGSAS program participants who were not considering a major in agriculture before their Governor's School experience but were afterwards (*change to agriculture major*) reported the following five factors influencing their choice of a college major in order of importance: personal interests (M = 2.93), personal happiness (M = 2.85), personal ability and skills (M = 2.79), career interests (M = 2.76) and use of special talents (M = 2.27; Table 31). The relative importance of factors for this group coincided with the relative importance for the total PGSAS population. Each influence factor was equal to or greater in relative importance for this group when compared with the overall population.

Influences on Choice of Career

Individuals and Experiences Influencing Choice of Career

PGSAS program participants reported information for the following individuals and experiences regarding the degree of relative influence on their choice of a career (Table 32).

Table 30. Selected Individuals and Experiences Influencing Program Respondents of the Pennsylvania Governor's School for the Agricultural Sciences (PGSAS) Choice of College Major Based on Their Major Decision.

Influence	Total N = 235		Major Decision: Change to Ag Major N = 67		Change Away Ag Major N = 9		No Change Ag Major N = 106		No Change to Ag Major N = 50	
	M	Rank	M	Rank	M	Rank	M	Rank	M	Rank
PGSAS	2.11	1	2.33	1	1.86	3	2.27	1	1.48	5
Father	2.05	2	2.00	3	2.00	2	2.10	2	2.02	1
Mother	2.04	3	2.09	2	2.22	1	2.06	3	1.89	2
Person Employed in The Profession	1.80	4	1.70	4	1.63	6	2.01	4	1.45	6
High School Teacher	1.74	5	1.63	5	1.56	7	1.83	5	1.76	3
Sibling	1.36	11	–	–	1.77	4	–	–	–	–
Friend	1.53	7	–	–	1.75	5	–	–	1.50	4

[a]Influence scale was: 0 = not applicable/available; 1 = no influence; 2 = some influence; and 3 = strong influence.

Note: The data were organized into four distinct categories reflecting program participants' responses to two questions regarding their intent to major in an agricultural or agriculture-related field in relationship to their Governor's School experience:
Change to Agriculture Major -- PGSAS program participants who before attending Governor's School were not considering entering a major in or related to food, agriculture and natural resources but after attending Governor's School have considered entering a major in or related to food, agriculture and natural resources.
Change Away Agriculture Major -- PGSAS program participants who before attending Governor's School were considering entering a major in or related to food, agriculture and natural resources and who after attending Governor's School were no longer considering entering a major in or related to food, agriculture and natural resources.
No Change Agriculture Major -- PGSAS program participants who before and after attending Governor's School were considering entering a major in or related to food, agriculture and natural resources.
No Change to Agriculture Major -- PGSAS program participants who before and after attending Governor's School were not considering entering a major in or related to food, agriculture and natural resources.

Table 31. Selected Personal Factors Influencing Program Respondents of the Pennsylvania Governor's School for the Agricultural Sciences (PGSAS) Choice of College Major Based on Their Major Decision.

Factor	Total N = 235		Major Decision: Change to Ag Major N = 67		Change Away Ag Major N = 9		No Change Ag Major N = 106		No Change to Ag Major N = 50	
	M[a]	Rank	M[a]	Rank	M[a]	Rank	M[a]	Rank	M[a]	Rank
Personal Interests	2.91	1	2.93	1	2.89	1	2.94	1	2.84	1
Personal Happiness	2.84	2	2.85	2	2.67	3	2.90	2	2.74	3
Personal Ability and Skills	2.78	3	2.79	3	2.78	2	2.74	4	2.82	2
Career Interests	2.76	4	2.76	4	2.78	2	2.81	3	2.66	4
Use Of Special Talents	2.26	5	2.27	5	2.00	6	2.31	5	2.16	5
Availability Of Jobs	–	–	-	–	2.33	4	–	–	–	–
Difficulty Of Course/ Program Of Study	–	–	–	–	2.22	5	–	–	–	–

[a]Personal factor scale was: 1 = not important; 2 = somewhat important; and 3 = very important.

Note: The data were organized into four distinct categories reflecting program participants' responses to two questions regarding their intent to major in an agricultural or agriculture-related field in relationship to their Governor's School experience:
Change to Agriculture Major -- PGSAS program participants who before attending Governor's School were not considering entering a major in or related to food, agriculture and natural resources but after attending Governor's School have considered entering a major in or related to food, agriculture and natural resources.
Change Away Agriculture Major -- PGSAS program participants who before attending Governor's School were considering entering a major in or related to food, agriculture and natural resources and who after attending Governor's School were no longer considering entering a major in or related to food, agriculture and natural resources.
No Change Agriculture Major -- PGSAS program participants who before and after attending Governor's School were considering entering a major in or related to food, agriculture and natural resources.
No Change to Agriculture Major -- PGSAS program participants who before and after attending Governor's School were not considering entering a major in or related to food, agriculture and natural resources.

Table 32. Individuals and Experiences Influencing Program Respondents of the Pennsylvania Governor's School for the Agricultural Sciences (PGSAS) Choice of Career.

Influence Ranked by Mean	N	Mean[a]	S.D.
Person Employed in the Profession	220	2.06	.78
PGSAS	218	2.04	.71
Father	225	1.91	.72
Mother	225	1.88	.69
College Professor	210	1.72	.77
High School Teacher	219	1.69	.76
Friend	222	1.50	.62
Relative	215	1.34	.59
Sibling	214	1.33	.60
College Admissions Personnel	207	1.25	.51
High School Counselor	219	1.23	.48
High School Administrator	216	1.12	.39
Minister/Priest/Rabbi	199	1.07	.34

[a]Influence scale was: 0 = not applicable/available; 1 = no influence; 2 = some influence; and 3 = strong influence.

The greatest influence was reported for persons employed in the profession (M = 2.06), followed by PGSAS (M = 2.04), father (M = 1.91) and mother (M = 1.88). Individuals with little or no influence included friends and relatives and high school and college personnel. These mean values reflect a level of some influence on choice of a career. As in the section examining factors influencing choice of a college major, a more detailed examination of factors influencing choice of a career was developed. PGSAS participants' background factors examined included parents' level of education, residence and membership in selected youth organizations.

Individuals and Experiences Influencing Choice of Career Based on Father's Level of Education

Table 33 describes the relative influence of individuals and experiences on PGSAS program participants' choice of a career and their father's level of education. The PGSAS experience tended to have more influence on career choice for program participants whose fathers were college graduates (M = 2.24) than especially those whose fathers had some college but had not completed a bachelor's degree (M = 1.77). There were no differences found between program participants' influence ratings regarding choice of career and person employed in the profession, father or mother based on their father's level of education. Nor were there any differences found in participants' perceptions influence ratings regarding choice of career based on their mother's level of education.

Individuals and Experiences Influencing Choice of Career Based on Residence Status

Table 34 describes the relative influence of individuals and experiences on PGSAS program participants' choice of career and their place of residence. The PGSAS experience tended to have more influence on the career choice for program participants from a town or

Table 33. Importance of Selected Individuals and Experiences Influencing Pennsylvania Governor's School for the Agricultural Sciences (PGSAS) Program Respondents' Choice of Career Based on Their Father's Level of Education.

Influence Factor and Level of Father's Education	N	M[a]	S.D.
PGSAS			
Less H.S. Diploma	8	2.0	.76
H.S. Graduate/GED	42	2.07	.78
Voc. Technical	27	1.96	.71
Some College	13	1.77	.83
College Graduate	38	2.24	.71
Graduate Work	88	1.99	.65

[a]Influence scale was: 0 = not applicable/available; 1 = no influence; 2 = some influence; and 3 = strong influence.

village with under 10,000 in population (M = 2.32) than for participants from a city over 500,000 in population (M = 1.79). Fathers tended to influence program participants either from the suburbs (M = 2.08) or from the country (M = 2.02) career choice to a greater extent than participants from a large metropolitan city (M = 1.53). Mothers tended to influence the career choice of program participants who either lived in the country (M = 2.00) or on a farm (M = 2.07) to a greater extent than program participants who lived in a large metropolitan city.

Individuals Influencing Choice of Career Based on Agricultural Youth Organization Membership

Table 35 describes the relative importance of individuals influencing PGSAS program participants' choice of a career and their agricultural youth organization membership. Persons employed in the profession influenced program participants who were members of both FFA and 4-H (M = 2.44) to a greater extent than participants who were 4-H members (M = 1.97) only. There were no differences found between program participants' influence rating regarding choice of a career and PGSAS, their father or mother based on their agricultural youth organization membership.

Table 34. Importance of Selected Individuals and Experiences Influencing Pennsylvania Governor's School for the Agricultural Sciences (PGSAS) Program Respondents' Choice of Career Based on Their Residence Status.

Influence Factor and Residence Status	N	M[a]	S.D.
PGSAS			
Lg. Metropolitan City (>500,000)	14	1.79	.57
Medium City (50,000 - 500,000)	9	2.11	.93
Smaller City (20,000 - 49,999)	21	1.90	.77
Suburbs	50	1.98	.65
Town or Village (<10,000)	22	2.32	.65
Country (Outside City or Village)	43	2.00	.82
On a Farm	56	2.07	.66
Father			
Lg. Metropolitan City (>500,000)	17	1.53	.72
Medium City (50,000 - 500,000)	10	1.80	.63
Smaller City (20,000 - 49,999)	25	1.64	.81
Suburbs	49	2.08	.67
Town or Village (<10,000)	22	1.95	.72
Country (Outside City or Village)	41	2.02	.76
On a Farm	58	1.91	.66
Mother			
Lg. Metropolitan City (>500,000)	17	1.53	.72
Medium City (50,000 - 500,000)	10	1.80	.63
Smaller City (20,000 - 49,999)	25	1.76	.78
Suburbs	48	1.83	.66
Town or Village (<10,000)	22	1.82	.66
Country (Outside City or Village)	43	2.00	.65
On a Farm	57	2.07	.65

[a]Influence scale was: 0 = not applicable/available; 1 = no influence; 2 = some influence; and 3 = strong influence.

Table 35. Importance of Selected Individuals and Experiences Influencing Pennsylvania Governor's School for the Agricultural Sciences (PGSAS) Program Respondents' Choice of Career Based on Agricultural Youth Organization Membership.

Influence Factor and Agricultural Youth Organization Membership	N	M[a]	S.D.
Person Employed In The Profession			
FFA	25	2.24	.79
4-H	36	1.97	.77
Both FFA & 4-H	18	2.44	.70
Never FFA or 4-H	136	2.00	.77

[a]Influence scale was: 0 = not applicable/available; 1 = no influence; 2 = some influence; 3 = strong influence.

Personal Factors Influencing Choice of Career

PGSAS program participants identified the following three factors in order of importance as having a strong influence on their choice of career (Table 36). They were personal interests (M = 2.92), personal happiness (M = 2.91) and personal ability and skills (M = 2.80). Additional factors that had some influence included being able to help others (M = 2.48) and type of work environment (M = 2.46). Other factors that had little or no influence included: job location, availability, security and advancement and meeting new and interesting people. Income potential (M = 1.92) and prestige of career (M = 1.70) ranked thirteenth and sixteenth, respectively, out of a list of twenty-one factors. To create or perform artistic or literary works (M = 1.26) ranked last.

Personal Factors Influencing Choice of Career Based on Residence Status

Table 37 describes the relative influence of factors influencing PGSAS program participants choice of a career and their place of residence. Personal ability and skills was substantially more influential in career choice for youth from all residential areas when

Table 36. Personal Factors Influencing Pennsylvania Governor's School for the Agricultural Sciences (PGSAS) Program Respondents' Choice of Career.

Personal Factor Ranked by Mean	N	Mean[a]	S.D.
Personal Interests	230	2.92	.27
Personal Happiness	230	2.91	.31
Personal Ability and Skills	229	2.80	.42
Being Able to Help Others	230	2.48	.57
Type of Work Environment	230	2.46	.58
Job Availability	230	2.18	.63
Meet New and Interesting People	229	2.14	.71
Job Security	230	2.13	.68
Geographic Area	230	2.11	.72
Potential for Advancement	230	2.07	.69
Economic Outlook for Career	230	2.00	.67
Contribution to Science	229	1.96	.77
Income Potential	229	1.92	.66
Previous Work Experience	230	1.83	.74
Recognized as Expert	230	1.80	.70
Prestige of Career	230	1.70	.67
Travel -- See New Places	230	1.66	.76
Position of Authority	229	1.62	.67
Own/Operate Own Business	228	1.46	.64
Prior Family Business/Work	230	1.40	.66
Create/Perform Artistic/ Literary Works	230	1.26	.55

[a]Personal factor scale was: 1 = not important; 2 = somewhat important; and 3 = very important.

Table 37. Selected Personal Factors Influencing Pennsylvania Governor's School for the Agricultural Sciences (PGSAS) Program Respondents' Choice of Career Based on Residence Status.

Influence Factor and Place of Residence	N	M[a]	S.D.
Personal Ability And Skills			
Lg. Metropolitan City (>500,000)	17	2.82	.53
Medium City (50,000 - 500,000)	10	2.30	.48
Smaller City (10,000 - 49,000)	24	2.87	.34
Suburbs	52	2.85	.41
Town or Village (<10,000)	22	2.68	.48
Country (Outside City or Village)	43	2.84	.37
On a Farm	58	2.81	.40

[a]Personal factor scale was: 1 = not important; 2 = somewhat important; and 3 = very important.

compared to youth from a medium sized city (M = 2.30). No differences were found between program participants' personal factor ratings regarding career choice and their personal interests and personal happiness based on their residence.

Individuals and Experiences Influencing Choice of Career Based on Major Decision

PGSAS program participants who were not considering an agriculture-related career prior to their Governor's School experience but were afterwards (*change to agriculture major*) reported PGSAS (M = 2.12) and person employed in the profession (M = 1.92) as the most influential experience and individual on their choice of career. The total PGSAS population identified person employed in the profession (M = 2.06) first and PGSAS (M = 2.04) second (Table 38). PGSAS program participants who were considering an agriculture-related career both before and after their Governor's School experience (*no change agriculture major*) identified the individuals and experiences in the same order as the total population. However, in this group persons employed in the

Table 38. Individuals and Experiences Influencing Pennsylvania Governor's School for the Agricultural Sciences (PGSAS) Program Respondents' Choice of Career by Major Decision.

Influence	Total N = 235		Major Decision: Change to Ag Major N = 67		Change Away Ag Major N = 9		No Change Ag Major N = 106		No Change to Ag Major N = 50	
	M[a]	Rank	M[a]	Rank	M[a]	Rank	M[a]	Rank	M[a]	Rank
Persons Employed in the Profession	2.06	1	1.92	2	1.78	4	2.22	1	1.98	2
PGSAS	2.04	2	2.12	1	1.71	5	2.19	2	1.62	5
Father	1.91	3	1.87	4	2.00	2	1.89	3	2.00	1
Mother	1.88	4	1.91	3	2.11	1	1.88	4	1.82	3
College Professor	1.72	5	1.70	5	1.88	3	1.78	5	1.60	6
High School Teacher	–	–	–	–	–	–	–	–	1.72	4

[a]Influence scale was: 0 = not applicable/available; 1 = no influence; 2 = some influence; and 3 = strong influence.

Note: The data were organized into four distinct categories reflecting program participants' responses to two questions regarding their intent to major in an agricultural or agriculture-related field in relationship to their Governor's School experience:
Change to Agriculture Major -- PGSAS program participants who before attending Governor's School were not considering entering a major in or related to food, agriculture and natural resources but after attending Governor's School have considered entering a major in or related to food, agriculture and natural resources.
Change Away Agriculture Major -- PGSAS program participants who before attending Governor's School were considering entering a major in or related to food, agriculture and natural resources and who after attending Governor's School were no longer considering entering a major in or related to food, agriculture and natural resources.
No Change Agriculture Major -- PGSAS program participants who before and after attending Governor's School were considering entering a major in or related to food, agriculture and natural resources.
No Change to Agriculture Major -- PGSAS program participants who before and after attending Governor's School were not considering entering a major in or related to food, agriculture and natural resources.

profession (M = 2.22), PGSAS (M = 2.19) and college professor (M = 1.78) had a somewhat higher influence than occurred in the total population.

Personal Factors Influencing Choice of Career Based on Major Decision

PGSAS program participants who were not considering an agriculture-related career before their Governor's School experience but were afterwards (*change to agriculture major*) indicated personal interests (M = 2.96), personal happiness (M = 2.94), personal ability and skills (M = 2.84), being able to help others (M = 2.34) and type of work environment (M = 2.45) as the top five factors in their career choice. Their ranking coincided with the total population factor ratings (Table 39).

Educational Aspirations

Future Educational Plans

The majority (59.5%) of PGSAS program participants plan to attend graduate school (Table 40). Approximately one-quarter (26.5%) of the participants plan to earn a Master of Science degree, thirty-nine percent (39.0%) plan to earn a Doctor of Philosophy degree, fifteen percent (14.7%) plan to earn a medical degree and twelve percent (12.4%) plan to study veterinary medicine. One-third (33.3%) of the program participants classified their choice of a graduate or professional major as related to agriculture and natural resources including veterinary medicine. One-fifth (20.3%) classified their choice of a graduate or professional major as medical-related. An additional fifteen percent (15.2%) plan to pursue a graduate or professional major in the biological sciences.

Table 39. Factors Influencing Program Respondents of the Pennsylvania Governor's School for the Agricultural Sciences (PGSAS) Choice of Career by Major Decision.

Factor	Total N = 235		Major Decision: Change to Ag Major N = 67		Change Away Ag Major N = 9		No Change Ag Major N = 106		No Change to Ag Major N = 50	
	M	Rank	M	Rank	M	Rank	M	Rank	M	Rank
Personal Interests	2.92	1	2.96	1	2.78	1	2.92	2	2.90	1
Personal Happiness	2.91	2	2.94	2	2.78	1	2.94	1	2.84	3
Personal Ability and Skills	2.80	3	2.84	3	2.67	2	2.76	3	2.85	2
Being Able to Help Others	2.48	4	2.34	5	2.67	2	2.53	5	2.47	4
Type of Work Environment	2.46	5	2.45	4	2.33	3	2.54	4	2.33	5
Economic Outlook	2.00	11	–	–	2.22	4	–	–	–	–
Geographic Area	2.11	9	–	–	2.11	5	–	–	–	–

[a]Personal factor scale was: 1 = not important; 2 = somewhat important; and 3 = very important.

Note: The data were organized into four distinct categories reflecting program participants' responses to two questions regarding their intent to major in an agricultural or agriculture-related field in relationship to their Governor's School experience:
Change to Agriculture Major -- PGSAS program participants who before attending Governor's School were not considering entering a major in or related to food, agriculture and natural resources but after attending Governor's School have considered entering a major in or related to food, agriculture and natural resources.
Change Away Agriculture Major -- PGSAS program participants who before attending Governor's School were considering entering a major in or related to food, agriculture and natural resources and who after attending Governor's School were no longer considering entering a major in or related to food, agriculture and natural resources.
No Change Agriculture Major -- PGSAS program participants who before and after attending Governor's School were considering entering a major in or related to food, agriculture and natural resources.
No Change to Agriculture Major -- PGSAS program participants who before and after attending Governor's School were not considering entering a major in or related to food, agriculture and natural resources.

Table 40. Future Educational Plans of Pennsylvania Governor's School for the Agricultural Sciences (PGSAS) Program Respondents.

Variable	N	%
Plan to Attend Graduate School		
Yes	138	59.5
No	94	40.5
	232	100.0
Highest Degree Expected to Achieve		
Master of Science	36	26.5
Doctor of Philosophy	53	39.0
Medical	20	14.7
Doctor of Veterinary Medicine	13	9.5
Veterinary Medical Doctor	4	2.9
Other	5	3.7
Undecided	5	3.7
	136	100.0
Graduate School Classification		
Agriculture/Natural Resources	25	18.1
Biological Sciences	21	15.2
Business	5	3.6
Engineering	12	8.7
Health Professions	6	4.4
Law	6	4.4
Medical	28	20.3
Veterinary	10	7.2
Other	17	12.3
Undecided	8	5.8
	138	100.0

Relationship Between Selected Factors and Participants' Intent Regarding Graduate Studies

The majority of PGSAS program participants, whether male (56.3%) or female (61.7%), plan to attend graduate or professional school (Table 41). A moderate relationship existed (Cramer's V = .29; $p \leq .01$) between PGSAS participants intent and their father's level of education, and a slightly lower relationship existed between the PGSAS participants' intent and their mother's level of education (Cramer's V = .23; $p \leq .01$). Substantially more of the program participants planning to attend graduate or professional school fathers (74.7%) and mothers (76.8%) had an education beyond the bachelor's degree. The majority of participants going on to graduate or professional school had an A (63.9%) average in high school.

Almost half (48.2%) of the program participants who are currently enrolled in college or have graduated reported attending Penn State University (Table 42). Over half (58.46%) of the program participants enrolled in high school reported Penn State University as either their first (35.4%) or second (23.1%) choice university (Table 43).

Future Educational Plans Based on Major Decision

Almost two-thirds (62.7%) of PGSAS program participants who were not considering an agriculture-related major prior to their Governor's School experience but were afterwards (*change to agriculture major*) plan to attend graduate or professional school (Table 44). Almost half (47.6%) of these program participants plan to earn a Doctor of Philosophy degree. Almost a quarter (23.8%) in this group classified their choice of a graduate or professional major as related to agriculture and natural resources including veterinary medicine.

Over half (55.7%) of the program paticipants who were considering an agriculture-related major both before and after their Governor's School experience (*no change agriculture major*) plan to attend graduate orprofessional school. Forty percent (39.7%)

Table 41. Relationships Between Pennsylvania Governor's School for the Agricultural Sciences (PGSAS) Program Respondents' Gender, Parents' Educational Level and High School Grade-Point Average and Their Intent to Enroll in Graduate or Professional School.

Characteristic	N	Intent Response Yes %	Intent Response No %	Correlation
Gender				
Male	103	56.3	43.7	Phi = .05
Female	128	61.7	38.3	
	231			
Father's Education				
High School or Less	54	40.7	59.3	Cramer's V = .28**
Postsecondary Including Bachelor's Degree	81	54.3	45.7	
Beyond Bachelor's Degree	95	74.7	25.3	
	230			
Mother's Education				
High School or Less	62	45.2	54.8	Cramer's V = .23**
Postsecondary Including Bachelor's Degree	114	58.8	41.2	
Beyond Bachelor's Degree	56	76.8	23.2	
	232			
High School Grade-Point Average				
A	191	63.9	36.1	Phi = .19
B	41	39.0	61.0	
	232			

**$p \leq .01$.
***$p \leq .001$.

Note: Parents'/guardians' level of education was defined as follows: high school or less -- parent/guardian who had less than high school diploma or who graduated from high school or had the high school equivalent (GED); postsecondary including bachelor's degree -- parent/guardian who had either vocational/technical training after high school, some college but didn't graduate, or college graduate (bachelor's degree); beyond bachelor's degree -- parent/guardian who did graduate work beyond the bachelor's degree.

Table 42. College Class Standing and Grade-Point Average for Pennsylvania Governor's School for the Agricultural Sciences (PGSAS) Program Respondents Currently Attending College.

Variable	N	%
College Class Identification		
Freshman	50	29.8
Sophomore	53	31.5
Junior	39	23.2
Senior	23	13.7
Graduate	2	1.2
Other	1	.6
	168	100.0
College Grade-Point Average		
A (4.00)	5	3.1
A- (3.67 - 3.99)	32	19.5
B+ (3.33 - 3.66)	41	25.0
B (3.00 - 3.32)	33	20.1
B- (2.67 - 2.99)	28	17.1
C+ (2.33 - 2.66)	12	7.3
C (2.00 - 2.32)	11	6.7
D (1.00 - 1.99)	2	1.2
	164	100.0
Institution		
Penn State	82	48.2
Other - PA	34	20.0
Out Of State	54	31.8
	170	100.0

Table 43. First, Second and Third Choice Higher Education Institutions for Pennsylvania Governor's School for the Agricultural Sciences (PGSAS) Program Respondents Who Completed the High School Questionnaire.

Variable	N	%
First Choice Institution		
Penn State	23	35.4
Other - PA	8	12.3
Out Of State	31	47.7
Undecided	3	4.6
	65	100.0
Second Choice Institution		
Penn State	15	23.1
Other - PA	9	13.9
Out Of State	40	61.5
Undecided	1	1.5
	65	100.0
Third Choice Institution		
Penn State	3	4.6
Other - PA	11	16.9
Out Of State	50	76.9
Undecided	1	1.6
	65	100.0

Table 44. Future Educational Plans of Pennsylvania Governor's School for the Agricultural Sciences (PGSAS) Program Respondents Based on Major Decision.

Variable	Major Decision: Change to Ag Major N	%	Change Away Ag Major N	%	No Change Ag Major N	%	No Change to Ag Major N	%
Plan to Attend Graduate School								
Yes	42	62.7	6	66.7	59	55.7	30	60.0
No	25	37.3	3	33.3	47	44.3	20	40.0
	67	100.0	9	100.0	106	100.0	50	100.0
Highest Degree Expected to Achieve								
Master of Science	6	14.3	5	83.3	18	31.0	6	20.7
Doctor of Philosophy	20	47.6	1	16.7	23	39.7	8	27.6
Medical	7	16.7	0	0.0	2	3.4	11	38.0
Doctor of Veterinary Medicine	3	7.1	0	0.0	10	17.2	0.0	0.0
Veterinary Medical Doctor	1	2.4	0	0.0	2	3.5	1	3.4
Other	2	4.8	0	0.0	2	3.5	2	6.9
Undecided	3	7.1	0	0.0	1	1.7	1	3.4
	42	100.0	6	100.0	58	100.0	29	100.0
Graduate School Classification								
Agriculture/Natural Resources	6	14.3	0	0.0	19	32.2	0	0.0
Biological Sciences	5	12.0	0	0.0	15	25.4	1	3.3
Business	0	0.0	1	16.7	2	3.4	2	6.7
Engineering	2	4.8	0	0.0	4	6.7	5	16.7
Health Professions	0	0.0	2	33.3	1	1.7	3	10.0
Law	3	7.1	1	16.7	1	1.7	1	3.3
Medical	9	21.4	0	0.0	5	8.5	13	43.3
Veterinary	4	9.5	0	0.0	5	8.5	1	3.3
Other	9	21.4	2	33.3	5	8.5	2	6.7
Undecided	4	9.5	0	0.0	2	3.4	2	6.7
	42	100.0	6	100.0	59	100.0	30	100.0

Note: The data were organized into four distinct categories reflecting program participants' responses to two questions regarding their intent to major in an agricultural or agriculture-related field in relationship to their Governor's School experience:

Change to Agriculture Major -- PGSAS program participants who before attending Governor's School were not considering entering a major in or related to food, agriculture and natural resources but after attending Governor's School have considered entering a major in or related to food, agriculture and natural resources.

Change Away Agriculture Major -- PGSAS program participants who before attending Governor's School were considering entering a major in or related to food, agriculture and natural resources and who after attending Governor's School were no longer considering entering a major in or related to food, agriculture and natural resources.

No Change Agriculture Major -- PGSAS program participants who before and after attending Governor's School were considering entering a major in or related to food, agriculture and natural resources.

No Change to Agriculture Major -- PGSAS program participants who before and after attending Governor's School were not considering entering a major in or related to food, agriculture and natural resources.

intend to earn a Doctor of Philosophy degree and one-fifth (20.7%) plan to earn a degree in veterinary medicine. Of this group, forty percent (40.7%) classified their choice of a graduate or professional school as related to agriculture and natural resources including veterinary medicine. A quarter (25.4%) of the group plan to pursue graduate studies in the biological sciences.

The majority (60.0%) of program participants who were not considering an agriculture-related major either before or after their Governor's School experience (*no change to agriculture major*) also plan to attend graduate school. This group's primary interest was in medical (43.3%) school.

Career Aspirations

Future Career Plans

One-fifth (20.4%) of PGSAS program participants classified their future career in the area of food, agriculture and natural resources (Table 45). Twenty-two percent (22.6%) of the participants plan to be private professionals and eighteen percent (18.3%) were undecided of future career plans at the time of completing the questionnaire.

Table 45. Future Career Classification for Pennsylvania Governor's School for the Agricultural Sciences (PGSAS) Program Respondents.

Variable	N	%
Future Career Classification		
Business Or Industry	40	17.4
Government Or Public Service	38	16.5
Private Professional	52	22.6
Military	2	.9
Homemaker	2	.9
Food, Agriculture and Natural Resources	47	20.4
Undecided	42	18.3
Other	7	3.0
	230	100.0

Future Career Plans Based on Major Decision

Eighteen percent (17.9%) of PGSAS program participants who were not considering an agriculture-related major prior to their Governor's School experience but were afterwards (*change to agriculture major*) classified their future career as food, agriculture and natural resources (Table 46). One-third (32.7%) of PGSAS program participants who were considering a major related to agriculture both before and after their Governor's School experience classified their future career as food, agriculture and natural resources.

Participants' Statements Regarding an Event or Experience Influencing Their Choice of College Major or Career

PGSAS program participants provided 172 written comments in regard to an event or experience that influenced their choice of a college major or career. These influences included PGSAS, high school or college class, high school teacher or college professor, extracurricular activities, work experience, parents and life experiences. The PGSAS classes, teachers, mentors and independent study project accounted for 50 of the written responses. Extracurricular activities such as science fairs, field trips, summer apprenticeship programs, scouting, 4-H and FFA accounted for 31 of the written responses. Life experiences such as living abroad, volunteering in a hospital, living on a farm, caring for pets at home and doing missionary work accounted for 43 of the written responses.

Table 46. Future Career Plans of Pennsylvania Governor's School for the Agricultural Sciences (PGSAS) Program Respondents Based on Major Decision.

Variable	Major Decision							
	Change to Ag Major		Change Away Ag Major		No Change Ag Major		No Change to Ag Major	
	N	%	N	%	N	%	N	%
Future Career Classification								
Business or Industry	12	17.9	1	11.1	15	14.4	11	22.5
Government or Public Service	13	19.4	4	44.4	14	13.5	7	14.3
Private Professional	14	20.9	2	22.2	19	18.3	17	34.7
Military	0	0.0	0	0.0	2	1.9	0	0.0
Homemaker	1	1.5	0	0.0	0	0.0	1	2.0
Food, Agriculture and Natural Resources	12	17.9	1	11.1	34	32.7	0	0.0
Undecided	14	20.9	1	11.1	17	16.3	10	20.4
Other	1	1.5	0	0.0	3	2.9	3	6.1
	67	100.0	9	100.0	104	100.0	49	100.0

Note: The data were organized into four distinct categories reflecting program participants' responses to two questions regarding their intent to major in an agricultural or agriculture-related field in relationship to their Governor's School experience:

Change to Agriculture Major -- PGSAS program participants who before attending Governor's School were not considering entering a major in or related to food, agriculture and natural resources but after attending Governor's School have considered entering a major in or related to food, agriculture and natural resources.

Change Away Agriculture Major -- PGSAS program participants who before attending Governor's School were considering entering a major in or related to food, agriculture and natural resources and who after attending Governor's School were no longer considering entering a major in or related to food, agriculture and natural resources.

No Change Agriculture Major -- PGSAS program participants who before and after attending Governor's School were considering entering a major in or related to food, agriculture and natural resources.

No Change to Agriculture Major -- PGSAS program participants who before and after attending Governor's School were not considering entering a major in or related to food, agriculture and natural resources.

Assessment of Research Experience

Extent of Benefit from Independent Research Project (IRP)/Independent Study Project (ISP)

Overall the majority of PGSAS program participants benefited greatly from participating in the IRP/ISP project (Table 47). The three greatest benefits of the experience were writing research reports (93.9%), conducting research myself (92.4%) and working on the IRP/ISP project (92.1%).

Degree of Satisfaction with Independent Research Project (IRP)/Independent Study Project (ISP)

Overall the majority of PGSAS program participants were satisfied with the IRP/ISP project experience (Table 48). The two greatest satisfactions were working independently (92.1%) and learning research techniques (87.2%).

Extent of Benefit from Independent Research Project (IRP)/Independent Study Project (ISP) Based on Year

For each year the extent of benefit was fairly consistent for the class of 1987 through the class of 1990 (Table 49). The class of 1986 rated getting to know mentors (M = 2.94), attending IRP/ISP class (M =- 3.09), presenting IRP/ISP to program participants and mentors (M = 2.55), writing research reports (M = 3.17) and writing research abstracts (M = 2.82) consistently lower than the succeeding four classes. Even though the ratings were somewhat lower, they still reflected some degree of benefit.

Degree of Satisfaction with Independent Research Project (IRP)/Independent Study Project (ISP) Based on Year

For each year the degree of satisfaction was fairly consistent for the class of 1987 through the class of 1990 (Table 50). The class of 1986 rated learning research techniques (M = 2.97), work independently (M = 3.46), receiving adequate technical/scientific

Table 47. Extent of Benefit of Pennsylvania Governor's School for the Agricultural Sciences (PGSAS) Program Respondents from the Independent Research Project (IRP)/Independent Study Project (ISP).

Statement	N	Response Options: Extremely Beneficial %	Slightly Beneficial %	Neutral Not Sure %	No Benefit %
Seeing How Research is Really Done	226	59.7	29.6	6.6	4.0
Conducting Research Myself	226	68.1	24.3	4.9	2.7
Getting to Know Mentors	224	50.4	33.0	9.4	7.1
Attending IRP/ISP Group Classes	221	17.6	36.2	24.0	22.2
Working on IRP/ISP	227	63.0	29.1	5.7	2.2
Presenting IRP/ISP Results to Program Participants And Mentors	222	51.4	33.8	10.4	4.5
Writing Research Reports	227	60.4	33.5	3.1	3.1
Writing Research Abstracts	226	53.1	34.5	5.8	6.6

Table 48. Degree of Satisfaction of Pennsylvania Governor's School for the Agricultural Sciences (PGSAS) Program Respondents with the Independent Research Project (IRP)/Independent Study Project (ISP).

Statement	N	Response Options: Very Satisfied %	Slightly Satisfied %	Neutral Not Sure %	Very Dissatisfied %
Learning Research Techniques	227	57.7	29.5	7.5	5.3
Work Independently	227	67.0	25.1	6.6	1.3
Receiving Adequate Technical/ Scientific Guidance	225	56.0	28.0	6.7	9.3
Working on Relevant Research	226	61.1	23.5	11.1	4.4
Being a Member of a Research Team	222	36.0	28.4	30.6	5.0

Table 49. Extent of Benefit of Pennsylvania Governor's School for the Agricultural Sciences (PGSAS) Program Respondents from the Independent Research Project (IRP)/ Independent Study Project (ISP) Reported by Year.

	Year Attended PGSAS																	
	1986			1987			1988			1989			1990			Total		
Variable	N	M[a]	S.D.	N	M[a]	S.D.	N	M[a]	S.D.	N	M[a]	S.D.	N	M[a]	S.D.	N	M[a]	S.D.
Seeing How Research is Really Done	34	3.03	.90	45	3.38	.81	46	3.52	.75	49	3.49	.82	52	3.69	.58	226	3.45	.79
Conducting Research Myself	35	3.34	.91	45	3.58	.66	46	3.54	.81	48	3.58	.68	52	3.77	.47	226	3.58	.71
Getting to Know Mentors	33	2.94	1.14	45	3.29	.90	46	3.17	1.04	48	3.42	.74	52	3.40	.69	224	3.27	.90
Attending IRP/ISP Group Classes	30	2.33	.92	45	2.82	.94	46	2.61	.95	48	2.04	1.09	52	2.62	1.03	221	2.49	1.03
Working on IRP/ISP	35	3.09	.98	45	.360	.62	46	3.43	.78	49	.359	.57	52	3.79	.41	227	3.53	.71
Presenting IRP/ISP to Program Participants and Mentors	31	2.55	.96	45	3.53	.69	46	3.35	.87	48	3.35	.79	52	3.54	.61	222	3.32	.84
Writing Research Reports	35	3.17	.98	45	3.49	.59	46	3.61	.54	49	3.51	.82	52	3.67	.51	227	3.51	.71
Writing Research Abstracts	34	2.82	1.09	45	3.36	.71	46	3.35	.85	49	3.47	.89	52	3.54	.67	226	3.34	.86

[a]Benefit scale was: 1 = no benefit; 2 = neutral/not sure; 3 = slightly beneficial; and 4 = extremely beneficial.

Table 50. Degree of Satisfaction of Pennsylvania Governor's School for the Agricultural Sciences (PGSAS) Program Respondents with the Independent Research Project (IRP)/ Independent Study Project (ISP) Reported by Year.

	Year Attended PGSAS																	
	1986			1987			1988			1989			1990			Total		
Variable	N	M[a]	S.D.	N	M[a]	S.D.	N	M[a]	S.D.	N	M[a]	S.D.	N	M[a]	S.D.	N	M[a]	S.D.
Learning Research Techniques	35	2.97	1.01	45	3.38	.81	46	3.46	.81	49	3.53	.84	52	3.52	.70	227	3.40	.84
Work Independently	35	3.46	.92	45	3.62	.61	46	3.61	.58	49	3.51	.71	52	3.65	.59	227	3.58	.68
Receiving Adequate Technical/Scientific Guidance	33	2.97	1.13	45	3.36	.83	46	3.22	1.13	49	3.33	.90	52	3.54	.75	225	3.31	.95
Working on Relevant Research	35	2.86	1.12	45	3.56	.69	46	3.43	.86	48	3.48	.80	52	3.58	.70	226	3.41	.86
Being a Member of a Research Team	33	2.52	1.06	43	3.09	.84	46	2.83	.95	48	3.25	.84	52	2.96	.88	222	2.96	.93

[a]Satisfaction scale was: 1 = very dissatisfied; 2 = neutral/not sure; 3 = slightly satisfied; and 4 = very satisfied.

guidance (M = 2.97) working on relevant research (M = 2.86) and being a member of a research team (M = 2.52) consistently lower than the succeeding four classes. Again, even though these ratings are somewhat lower they still reflect some degree of benefit.

Degree of Benefit from Independent Research Project (IRP)/Independent Study Project (ISP) Based on High School Course of Study

Table 51 describes the relationship between participants' extent of benefit from the IRP/ISP experience based on their high school course of study. A .5 differential between mean scores was used as the criterion to determine if substantial differences existed between program participants' ratings of the IRP/ISP. One difference was found between participants enrolled in the vocational/college preparatory curriculum in high school and those enrolled in the general preparatory curriculum regarding getting to know mentors. PGSAS program participants enrolled in the vocational/college preparatory curriculum (M = 3.57) in high school benefited to a greater degree from getting to know mentors during their research experience than participants enrolled in the general preparatory curriculum (M = 2.87). No additional differences were found among program participants in regard to the extent of benefit and degree of satisfaction with the IRP/ISP based on their high school course of study. Nor were there any differences when the investigator explored the extent of benefit and degree of satisfaction with the IRP/ISP based on program participants' gender or their intent to enroll in graduate school.

Extent of Benefit from Independent Research Project (IRP)/Independent Study Project (ISP) Based on Major Decision

Program participants who were not considering an agriculture-related career before their Governor's School experience but were afterwards (*change to agriculture major*) benefited most from working on the IRP/ISP (M = 3.63), conducting research themselves

Table 51. Extent of Benefit of Pennsylvania Governor's School for the Agricultural Sciences (PGSAS) Program Respondents with the Independent Research Project (IRP)/Independent Study Project (ISP) Based on High School Course of Study.

Benefit and High School Course of Study	N	M[a]	S.D.
Getting to Know Mentors			
General	16	2.87	1.09
College Preparatory	171	3.26	.94
Vocational	4	3.00	.00
Vocational/College	28	3.57	.50
Other	2	3.50	.71
	221		

[a]Scale was: 1 = no benefit; 2 = neutral/not sure; 3 = slightly beneficial; and 4 = extremely beneficial.

(M = 3.58) and writing research reports (M = 3.58; Table 52). Program participants who were considering a major in agriculture both before and after their Governor's School experience (*no change agriculture major*) received the greatest benefit from conducting the research themselves (M = 3.73). Participants who were not considering an agriculture major either before or after their Governor's School experience (*no change to agriculture major*) rated their experience with the research project lower than other participants in most cases.

Degree of Satisfaction with Independent Research Project (IRP)/ Independent Study Project (ISP) Based on Major Decision

Program participants who were not considering an agriculture major either before or after their Governor's School experience (*no change to agriculture major*) tended to be less satisfied with their research experience than other participants (Table 53). Both groups of participants who were considering an agriculture major after their Governor's School experience got the most satisfaction from working independently. Working independently was rated the highest by all four major decision groups.

Table 52. Extent of Benefit of Pennsylvania Governor's School for the Agricultural Sciences (PGSAS) Program Respondents with the Independent Research Project (IRP)/ Independent Study Project (ISP) Based on Major Decision.

	Major Decision							
	Change To Ag Major		Change Away Ag Major		No Change Ag Major		No Change To Ag Major	
Variable	N	M[a]	N	M[a]	N	M[a]	N	M[a]
Seeing How Research Is Really Done	61	3.47	9	3.33	104	3.57	49	3.18
Conducting Research Myself	62	3.58	9	3.11	103	3.73	49	3.33
Getting To Know Mentors	61	3.21	9	3.11	103	3.39	48	3.15
Attending IRP/ISP Group Classes	61	2.70	7	2.00	101	2.52	49	2.16
Working On IRP/ISP	62	3.63	9	3.22	104	3.61	49	3.31
Presenting IRP/ISP Results To Participants And Mentors	61	3.51	8	2.88	103	3.44	47	2.91
Writing Research Reports	62	3.58	9	3.11	104	3.64	49	3.26
Writing Research Abstracts	62	3.53	9	3.00	103	3.44	49	3.00

[a]Benefit scale was: 1 = no benefit; 2 = neutral/not sure; 3 = slightly beneficial; and 4 = extremely beneficial.

Note: The data were organized into four distinct categories reflecting program participants' responses to two questions regarding their intent to major in an agricultural or agriculture-related field in relationship to their Governor's School experience:
Change to Agriculture Major -- PGSAS program participants who before attending Governor's School were not considering entering a major in or related to food, agriculture and natural resources but after attending Governor's School have considered entering a major in or related to food, agriculture and natural resources.
Change Away Agriculture Major -- PGSAS program participants who before attending Governor's School were considering entering a major in or related to food, agriculture and natural resources and who after attending Governor's School were no longer considering entering a major in or related to food, agriculture and natural resources.
No Change Agriculture Major -- PGSAS program participants who before and after attending Governor's School were considering entering a major in or related to food, agriculture and natural resources.
No Change to Agriculture Major -- PGSAS program participants who before and after attending Governor's School were not considering entering a major in or related to food, agriculture and natural resources.

Table 53. Degree of Satisfaction of Pennsylvania Governor's School for the Agricultural Sciences (PGSAS) Program Respondents with the Independent Research Project (IRP)/ Independent Study Project (ISP) Reported by Major Decision.

	Major Decision							
	Change To Ag Major		Change Away Ag Major		No Change Ag Major		No Change To Ag Major	
Variable	N	M[a]	N	M[a]	N	M[a]	N	M[a]
Learning Research Techniques	63	3.31	9	3.62	103	3.54	49	3.15
Work Independently	63	3.59	9	3.75	103	3.62	49	3.42
Receiving Adequate Technical/ Scientific Guidance	62	3.50	9	3.50	103	3.33	48	3.00
Working on Relevant Research	63	3.55	9	3.62	103	3.44	48	3.18
Being A Member of a Research Team	63	3.03	7	2.83	102	2.94	47	2.88

[a]Satisfaction scale was: 1 = very dissatisfied; 2 = neutral/not sure; 3 = slightly satisfied; and 4 = very satisfied.

Note: The data were organized into four distinct categories reflecting program participants' responses to two questions regarding their intent to major in an agricultural or agriculture-related field in relationship to their Governor's School experience:
Change to Agriculture Major -- PGSAS program participants who before attending Governor's School were not considering entering a major in or related to food, agriculture and natural resources but after attending Governor's School have considered entering a major in or related to food, agriculture and natural resources.
Change Away Agriculture Major -- PGSAS program participants who before attending Governor's School were considering entering a major in or related to food, agriculture and natural resources and who after attending Governor's School were no longer considering entering a major in or related to food, agriculture and natural resources.
No Change Agriculture Major -- PGSAS program participants who before and after attending Governor's School were considering entering a major in or related to food, agriculture and natural resources.
No Change to Agriculture Major -- PGSAS program participants who before and after attending Governor's School were not considering entering a major in or related to food, agriculture and natural resources.

Participants' Statements Regarding New Knowledge About Conducting Research Related to Agriculture

Relative to new knowledge or information gained in regard to conducting research, program participants wrote that they learned proper research procedures and the role and scope of research. A total of 249 comments were written by program participants regarding conducting research. The written comments reflected program participants' new insight into the scope of research, exposure to proper research procedures and applications, and career and personal development.

PGSAS program participants reported using this new knowledge to improve their academic skills, in making career decisions and personal growth and development. In their use of this new knowledge, respondents specifically identified enhanced writing, library, and research skills. With regard to their use of this new knowledge in personal growth and development, respondents reported new insight as to the importance of research and a greater interest, understanding and appreciation of science.

Chapter 5

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

This chapter presents the summary, conclusions and recommendations of the study. It includes the purpose and objectives of the study, research questions, procedures used, findings, conclusions and recommendations for future study.

Purpose of the Study

The primary purpose of this study was to determine if the Pennsylvania Governor's School for the Agricultural Sciences (PGSAS) provided program participants with experiences and information which expanded their knowledge of educational and career opportunities related to food, agriculture and natural resources. A second purpose was to determine if the Governor's School experience provided program participants with an opportunity to explore scientific concepts, interact with professional scientists and to use research techniques available in the agricultural sciences.

The following research questions were formulated:

1. What factors influence educational aspirations of Pennsylvania Governor's School for the Agricultural Sciences program participants when examining background characteristics such as gender, residence status, parents' educational level, high school course of study, agricultural youth organization membership and their decision about a college major?
2. What factors influence career aspirations of Pennsylvania Governor's School for the Agricultural Sciences program participants when examining background characteristics such as gender, residence status, parents' educational level, high school course of study, agricultural youth organization membership and their decision about a college major?

3. Are there differences in perceptions of Pennsylvania Governor's School for the Agricultural Sciences program participants regarding careers in or related to food, agriculture and natural resources when examining background characteristics such as gender, residence status, parents' educational level, high school course of study, agricultural youth organization membership and their decision about a college major?

4. Are there differences regarding extent of perceived benefits and the degree of satisfaction with the independent research (IRP)/independent study project (ISP) of Pennsylvania Governor's School for the Agricultural Sciences program participants when examining background characteristics such as gender, high school course of study, intent to attend graduate school and their decision about a college major?

Procedures

The target population for this study was all program participants from the Pennsylvania Governor's School for the Agricultural Sciences for the classes from 1986 through the class of 1990, totaling 313 participants.

One questionnaire was developed then modified into two versions to accommodate PGSAS program participants currently enrolled in high school and program participants who graduated from high school. The high school questionnaire consisted of 133 items and the high school graduate questionnaire consisted of 136 items. Both questionnaires had five distinct parts and began with a filter question to establish the program participants plans the first year following graduation from high school.

The questionnaire was pilot tested using 107 urban agriculture high school students and freshman students enrolled in Freshman Seminar (Ag 198) in the College of Agriculture at The Pennsylvania State University. The purpose of the pilot test was to

identify problems regarding content validity and accuracy of the statements and to secure a preliminary estimate for the reliability of the career perceptions component of the questionnaire. The career perception component had a marginally acceptable reliability value (Cronbach's alpha = .67).

After the establishment of questionnaire content validity and reliability, a cover letter, number-coded questionnaire and a self-addressed, stamped envelope were mailed to 313 PGSAS program participants. Seventy-five of the 313 program participants were under the age of 18 at the time of the study. For those under 18 years of age, parent/guardian consent letters were mailed approximately two weeks before the questionnaire to obtain parent/guardian consent. One hundred percent of the parent/guardian consent forms were returned. Usable responses were returned by 75 percent (75.08) of the PGSAS program participants.

Sociodemographic Profile of Program Participants

Over half (56%) of the PGSAS program participants were female. The majority (90%) of the participants were white or Anglo-American. Two-thirds of the participants lived either in the suburbs, in the country or on a farm.

The majority (58%) of the program participants' fathers were college graduates and over 40 percent of their fathers had completed graduate work beyond the bachelor's degree. Almost half of the program participants' mothers were college graduates and one-quarter of the mothers had completed graduate work beyond the bachelor's degree. Half of the program participants' fathers occupations were classified as professional. About one-third of the program participants' mothers occupations were classified as professional/technical. A quarter of the program participants' mothers were full-time homemakers.

The majority (77%) of the program participants were enrolled in college preparatory curriculum in high school. Almost 13 percent were enrolled in the vocational/college curriculum. Four-fifths of the program participants had an A average. Two-thirds of the program participants were rising seniors at the time they completed the PGSAS program. The majority (64%) of the participants had never been a member of FFA or 4-H. Over one-third of the PGSAS program participants received national merit scholar recognition. Over half (58%) of the participants attended a public 4-year institution following high school graduation.

Conclusions

Objective 1

Objective 1 was to determine if the Pennsylvania Governor's School for the Agricultural Sciences provided program participants with experiences and information which expanded their knowledge of educational opportunities related to food, agriculture and natural resources. To facilitate the analysis of data, the following research question was formulated:

> What factors influence educational aspirations of Pennsylvania Governor's School for the Agricultural Sciences program participants when examining background characteristics such as gender, residence status, parents' educational level, high school course of study, agricultural youth organization membership and their decision about a college major?

The findings revealed that the PGSAS experience and program participants' fathers and mothers had some degree of influence on their choice of a college major. Participants did not, however, rate any one experience or individual as having a strong influence on their choice. The PGSAS experience had slightly more of an influence on participants who either lived in the country, who were enrolled in the vocational/college curriculum in high school, or who were members of FFA. Perhaps program participants who lived in the country, were enrolled in vocational/college preparatory in high school or were members of

FFA had a greater opportunity to experience broadened dimensions of the agriculture-related industry prior to their Governor's School experience.

When program participants' major decision was considered, PGSAS had the most influence on participants who were not considering an agriculture-related major before their Governor's School experience but were afterwards (*change to agriculture major*) and those participants who were considering an agriculture-related both before and after their Governor's School experience (*no change agriculture major*). Perhaps the participants classified in these two groups were more open to exploring agriculture-related major possibilities than those participants who were not considering an agriculture-related major either before or after their experience.

Super (1971) wrote that development of an individual can be aided and guided by adequate opportunities for the utilization of aptitudes and for the development of interests. Super claimed that development is the result of interaction. The PGSAS experience is an intervention activity that fits into the exploration stage of Super and Bohn's (1970) theory of career development. During this stage, the individual becomes aware of their interests and abilities and how they can relate them to career opportunities. The Pennsylvania Governor's School for the Agricultural Sciences provides program participants with opportunities to explore potential majors and careers and to determine the fit of their personal abilities and interests.

Program participants rated personal interests, personal happiness, personal ability and skills and career interests as strong influences on their choice of a college major. The Farm Foundation (1989) study revealed personal interests and personal happiness as the two most important factors in choosing a college major. Erdmann (1983) and Bugaj (1990) found the availability of specific academic programs to be the single most important factor to students in the college selection process. Douglas and Powers (1985) identified

quality of course instruction and professional competence of professors to be the top two factors in choosing a college.

The majority of PGSAS program participants plan to attend graduate or professional school. Slightly more females than males plan to pursue graduate studies. Silverman (1989) wrote that gifted girls need encouragement to explore career possibilities that traditionally have been for males only. Fox (1981) claimed that exposure to role models is essential for gifted females. The Governor's School strives to provide all students with role models to identify with, yet in this study the influence of individuals who may arguably fit the description of role models was not considered to be very important. The influence of a person employed in the profession and a high school teacher were identified as having minimal influence. The influence of a college faculty member was relatively unimportant. Perhaps this reflects the fairly short duration of PGSAS (five weeks), and it may be unrealistic to expect a greater impact for a relatively short duration program. There was no difference in the relative influence of individuals who fit the description of role models when considering the gender of the PGSAS participant.

Dramatically more of the participants planning to attend graduate or professional school reported fathers (70.4%) and mothers (69.6%) with an education beyond the baccalaureate degree. Super and Bohn (1970) indicated that socioeconomic status, race and sex makes entry into educational and occupational positions easier or more difficult. Roe and Lunneborg (1990) cited race, sex, and the social and economic position of the family as important factors in determining how far various inherited characteristics may be developed within an individual.

Of the program participants planning to go to graduate or professional school, almost 40 percent of the program participants plan to earn a Doctor of Philosophy degree, 15 percent plan to earn a medical degree and about 12 percent plan to study veterinary medicine. One-third of the program participants classified their choice of a graduate or

professional major as related to agriculture and natural resources including veterinary medicine. One-fifth classified their choice of a graduate or professional major as medical-related. An additional 15 percent plan to pursue a graduate or professional major in the biological sciences. Only a small percent of the program participants going on to graduate or professional school are uncertain of the highest degree they expect to achieve and the classification of that degree.

Feldhusen and Sokol (1982) contended gifted youth need a variety of enriched and accelerated educational experiences to stimulate their development toward high level achievement in adulthood. Super and Bohn (1970) claimed that motivation determines how high a person aspires and how hard they work at acting upon their decisions.

When the participants' major decision was considered, almost a quarter of program participants who were not considering an agriculture-related major until after their Governor's School experience classified their choice of a graduate or professional major as related-to agriculture and natural resources including veterinary medicine. Almost half of these students plan to earn a Doctor of Philosophy degree.

Participants (79) identified in their written comments that one of the greatest benefits of their Governor's School experience was their expanded knowledge of food, agriculture and natural resources. One program participant wrote "I learned an incredible amount about various aspects of agriculture along with gaining an appreciation of the importance and influence of agriculture in many aspects of life".

Participants (86) wrote that Governor's School prepared them for college both academically and socially. In many cases Governor's School assisted program participants in bringing their academic goals into focus.

Objective 2

Objective 2 was to determine if the Pennsylvania Governor's School for the Agricultural Sciences provided program participants with experiences and information which expanded their knowledge of career opportunities related to food, agriculture and natural resources. To facilitate the analysis of data, the following research questions were formulated:

> What factors influence career aspirations of Pennsylvania Governor's School for the Agricultural Sciences program participants when examining background characteristics such as gender, residence status, parents' educational level, high school course of study, agricultural youth organization membership and their decision about a college major?
>
> Are there differences in perceptions of Pennsylvania Governor's School for the Agricultural Sciences program participants regarding careers in or related to food, agriculture and natural resources when examining background characteristics such as gender, residence status, parents' educational level, high school course of study, agricultural youth organization membership and their decision about a college major?

The findings revealed that PGSAS program participants did not rate any one individual or experience as having a strong influence on their choice of career. However, participants did rate a person employed in the profession, PGSAS, father and mother as having some degree of influence on career choice. When residence status was considered, the PGSAS experience, fathers and mothers tended to influence participants from a large metropolitan city to a lesser degree than those from other areas. Perhaps urban participants are exposed to a greater variety of life experiences than students from a more rural area. A person employed in the profession had the greatest influence on participants who were members of FFA and 4-H. Program participants who were members of FFA and 4-H have probably had more opportunities to interact with agricultural professionals than participants who were never members of either organization.

Silverman (1989) claimed that an effective career guidance tool is providing gifted students with real life experiences in some of their avenues of interests through internships,

mentorships, work-study or community based service. Herr (1976) wrote that gifted students benefit by working with persons who are achieved professionals.

Personal interests, personal happiness and personal ability and skills had the strongest influence on PGSAS program participants' choice of career. Participants were least influenced with factors related to potential for advancement, economic outlook for a career and income potential.

Super and Bohn (1970) organized determinants of career patterns into three distinct categories: psychological, social and economic and general (Table 4). Psychological determinants included: intelligence, special attitudes, interests, values and needs. Social determinants included: socioeconomic status, education, family situation, military service obligation, citizenship, race, religion and sex. Economic and general determinants included: business cycles, economic booms and depressions, fads, technological changes, war and natural disasters. Super and Bohn claimed that the interaction between internal and external determinants produce an individual's career decision. PGSAS participants career choice is most influenced by what Super and Bohn (1970) refer to as psychological determinants. Economic determinants were the least influential factors.

The Farm Foundation (1989) study found that persons in the profession of interest exerted the strongest influence on high school students' choice of a college major and choice of career. The study identified fathers, high school teachers and mothers as the most influential individuals. The Farm Foundation study also found that high school students initially decided upon their major and career during their junior year of high school.

Super and Bohn conceded social class, family context and the sphere of activity that open and close opportunities to the individual are important and potent determinants of career choice. Lester and Graham (1990) found a summer educational experience and adults other than parents to be the two greatest influences on career choice.

Career choice of PGSAS program participants who were considering an agriculture-related major both before and after their Governor's School experience (*no change agriculture major*) was influenced to a greater extent by a person employed in the profession and the Governor's School experience than other participants. A quarter of these students were enrolled in the vocational/college curriculum in high school. Perhaps these participants had a greater degree of career focus at the time of attendance as partially a result of their vocational/college curriculum experiences in high school.

One-fifth of PGSAS program participants classified their future career in the area of food, agriculture and natural resources. Twenty-two percent plan to become private professionals and 18 percent were undecided about their future career plans. Silverman (1989) wrote that not all gifted individuals decide upon a career in either high school or college. Silverman advocated that gifted students need a broad educational base to allow them to move in several different directions.

Eighteen percent of PGSAS program participants who considered an agriculture-related major since their Governor's School experience (*change to agriculture major*) classified their future career as food, agriculture and natural resources. One-third of the participants who were considering a major related-to agriculture both before and after their Governor's School experience (*no change agriculture major*) classified their future career as food, agriculture and natural resources.

Blau, Gustad, Jessor, Parnes and Wilcock (1971) identified the demand for new members in the occupation as indicated by the number of vacancies that exist at any one time as an occupational determinant. Blau et al. also identified an individual's knowledge about the requirements for career entry, the rewards offered, and the opportunities for employment and advancement as career determinants. Super and Bohn (1970) cited external factors such as business trends, economic instability and technology as major determinants of career plans. The findings in this study do not support the contention of

Blau et al. (1971) and Super and Bohn (1970) that external or economic factors serve as major determinants of career choice.

The Pennsylvania Governor's School for the Agricultural Sciences strives to present the many and varied agricultural career possibilities available to qualified college graduates in food, agriculture and natural resources. The success of this effort is reflected in participants current perceptions regarding careers in or related to food, agriculture and natural resources.

Program participants' current perceptions of careers in or related to food, agriculture and natural resources were positive and "more realistic" than those reported in the Farm Foundation (1989) study. A strong majority of the PGSAS participants did not associate agricultural careers with farming or manual labor. The majority of participants disagreed that agricultural careers were unattractive to females and minorities. The majority of participants were positive in regard to advancement opportunities in agriculture, the number of job opportunities and salary potential as compared to other college graduates. The majority of program participants were neutral as to whether agriculture graduates are able to pursue science careers, but participants did agree that agricultural graduates are desired by multinational corporations. The majority of participants disagreed that careers in agriculture are insecure because the agricultural economy fluctuates, that agriculture careers are rarely affected by world events and that agricultural careers are dependent on the weather.

Some differences did exist between program participants when factors such as gender, parents' education, high school curriculum and membership in selected agricultural youth organizations were considered. When gender was considered in relationship to current perceptions regarding careers in or related to food, agriculture and natural resources, females tended to be more positive for several statements than males. When participants' residence status was considered, program participants classified as either

urban, non-farm or city tended to have a slightly more positive outlook of agricultural careers as compared to participants who were classified as rural or farm. When father's and mother's level of education were considered, in most cases participants whose fathers or mothers had a minimum of some college tended to be more positive in their perceptions regarding agricultural careers. This was especially true of participants whose parents were college graduates. When high school course of study was considered, students enrolled in a general high school curriculum tended to be less positive in their perceptions regarding agricultural careers than students in the other three high school curriculum classifications. Program participants enrolled in the vocational/college high school curriculum tended to be more positive than students enrolled in strictly the vocational preparation curriculum in their perceptions of careers in or related to food, agriculture and natural resources. When agricultural youth organization membership was considered, participants who were members of FFA tended to be more positive in their perceptions than participants who were in 4-H, both FFA and 4-H or never FFA and 4-H in regard to careers in or related to food, agriculture and natural resources.

Objective 3

Objective 3 was to determine if the Pennsylvania Governor's School for the Agricultural Sciences provided program participants with an opportunity to explore scientific concepts, interact with professional scientists and to use research techniques available in the agricultural sciences. To facilitate the analysis of data, the following research question was formulated:

> Are there differences regarding extent of perceived benefits and the degree of satisfaction with the independent research (IRP)/independent study project (ISP) of Pennsylvania Governor's School for the Agricultural Sciences program participants when examining background characteristics such as gender, high school course of study, intent to attend graduate school and their decision about a college major?

Overall, PGSAS program participants benefited and were satisfied with their independent research project (IRP)/independent study project (ISP) experience. Program participants identified writing research reports, conducting research, and working on the IRP/ISP as the most beneficial aspects of their research experience. Participants identified working independently and learning research techniques as the most satisfying aspects of their research experience.

The initial class (1986) of the Pennsylvania Governor's School for the Agricultural Sciences tended to rate their perceived benefits and degree of satisfaction consistently lower than participants in succeeding years. This initial class was involved in the developmental phases of the IRP/ISP aspect of PGSAS. Subsequent classes benefited from a revised IRP/ISP program which provided more structure and direction. Faculty were also much more familiar with the IRP/ISP expectations and were able to provide a more structured activity for students. Program participants who were considering an agriculture-related major both before and after their Governor's School experience (*no change agriculture major*) rated seeing how research is really done, conducting research myself and getting to know mentors the highest. This group of students indicated an interest in agriculture before they participated in the program. Almost all of the program participants who were enrolled in a vocational/college curriculum in high school were classified as *no change agriculture majors*. Program participants who considered an agriculture-related major after their Governor's School experience (*change to agriculture major*) rated attending IRP/ISP group classes, working on IRP/ISP, presenting IRP/ISP results to participants and mentors, writing research reports and abstracts the highest of all the major decision groups.

Gustin (1984) acknowledged that numbers of students in schools possess specialized talents and extraordinary learning abilities to such a degree their needs cannot be met completely in a typical school program. Feldhusen and Sokol (1982) wrote that gifted youth need a variety of enriched and accelerated educational experiences to stimulate their

development. Feldhusen and Sokol (1982) claimed gifted students need to develop basic thinking skills earlier than average ability skills, to engage in disciplined and in-depth inquiry, to learn methods of research and analysis and to exercise self-direction in learning. In other words, they need to learn more, more rapidly, at higher levels, to greater depths of inquiry, and with more attention to organizational theories or concepts. Feldhusen and Sokol also claimed that these students need to acquire motivation through the stimulation of association with intellectual peers and through identification with adult models of successful individuals. Olszewski-Kubilius (1989) contended that summer programs provide students with an opportunity to participate in challenging course work that is commensurate in level and pace with a student's abilities and intellectual level.

Participants (42) wrote that the Governor's School experience provided them with an opportunity to explore agricultural research using new technologies and research. One program participant wrote that the independent project was "one of the best learning experiences I ever had."

Many of the program participants suggested expanding the IRP/ISP aspect of Governor's School. Participants' suggestions included increasing the number of hours available to work with mentors and the numbers of projects available.

Recommendations

1. The Pennsylvania Governor's School for the Agricultural Sciences should continue the program as it operates now based on the positive evaluation of the program structure by former participants.
2. The Pennsylvania Governor's School for the Agricultural Sciences should continue to identify for talented high school youth the array of educational and career opportunities in or related to the science, technology and policy of food, agriculture

and natural resources. Program personnel should continue to provide the structured real-life experiences gifted students need according to Silverman (1989). Currently PGSAS provides short-term mentorships for the students involving University-based personnel. The PGSAS should consider development of long-term mentorships involving local school personnel and local community members in the student's areas of career interest.

3. The Pennsylvania Governor's School for the Agricultural Sciences should continue to provide PGSAS program participants with resource materials on educational and career opportunities in or related to the science, technology and policy of food, agriculture and natural resources. Pennsylvania Governor's School for the Agricultural Sciences personnel should continue to procure resource materials for program participants to deliver at the local level to classsmates, teachers, guidance counselors, administrators and parents. PGSAS personnel should also continue to assist program participants in providing the agricultural career and educational materials to their local districts.
4. Program respondents indicated that their IRP/ISP experience was one of the most beneficial aspects of the Governor's School experience. Respondents indicated that more time was needed to work with their mentors. The Pennsylvania Governor's School for the Agricultural Sciences should place a greater emphasis on the independent study project through an increase in the number of hours program participants have to work with their mentor and on their ISP.
5. The current level of financial support is adequate to handle 58-60 participants. It is the investigator's belief that the program needs to involve teachers and counselors, but there would need to be an increase in the level of support. The reason for involving teachers and counselors is because these individuals need accurate, first-hand information regarding educational and career opportunities in or related to

food, agriculture and natural resources if they are to effectively educate local youth relative to educational and career opportunities in agriculture.

6. Both female and male program participants had strong positive perceptions regarding the opportunities and the roles of females in agriculture. No special activity is currently planned within the PGSAS program to focus on the role and opportunities for females in agriculture. These concepts are well incorporated throughout the program. However, the reality is that there are not very many female mentors available in the College of Agriculture. It is recommended that consideration be given to attracting mentors from other colleges and public agencies such as USDA to serve as instructors and mentors for the program.

Recommendations for Future Study

In conducting this study and upon examining the literature, the investigator recognizes the need for further research. The following are recommended areas of study:

1. This study developed an instrument to assess the influence of the Pennsylvania Governor's School for the Agricultural Sciences on program participants' perceptions regarding educational, career and research opportunities in food, agriculture and natural resources. This instrument also gathered information on program participants' self-development in terms of leadership, communication and interpersonal skills as a result of their Governor's School experience. However, this information was not analyzed in this study. Therefore, it is recommended that future research be conducted to determine the influence the Pennsylvania Governor's School for the Agricultural Sciences experience has on participants' self-development and growth specifically with regard to leadership, communication and interpersonal skills.

2. Future research should be conducted to obtain assessment information from PGSAS program participants' peers, significant others and parents/guardians with regard to program participants' self development and growth.
3. Because program evaluation and assessment are critical to program success, future researchers may replicate this study with other Governor's School participants in other programs. This type of research provides valuable information for program justification to local, state and national funding agencies.
4. Future research should be conducted on a longitudinal basis to determine the influence of Governor's School on program participants' lives and decisions regarding issues related to food, agriculture and natural resources.

REFERENCES

Abridged Fall 1989 Enrollment at the Member Institutions of the National Association of State Universities and Land Grant Colleges (NASULGC). (1990, June). NACTA Journal, 34, 4-13.

Annual Report of the Pennsylvania Governor's School for the Agricultural Sciences. (1990). Pennsylvania Governor's School for the Agricultural Sciences, The Pennsylvania State University, College of Agriculture. University Park, PA.

Blau, P. M., Gustad, J. W., Jessor, R., Parnes, H. S., & Wilcock, R. C. (1971). Occupational Choice: A Conceptual Framework. In H. J. Peters and J. C. Hansen (Eds.), Vocational Guidance and Career Development, (pp. 155-170). New York: The Macmillan Company.

Bugaj, A. M. (1990). Factors Involved in the College Choice Process of Superior High School Students. Paper presented at the Annual Meeting of the American Educational Research Association, Boston, MA.

Burck, H. D. (1984). Facilitating Career Development: Past Events, Current Scenes, and The Future. In H. D. Burck and R. C. Reardon (Eds.), Career Development Interventions, (pp. 5-24). Springfield, Illinois: Charles C. Thomas.

Coulter, K. J. (1985). The Agricultural Image. NACTA JOURNAL. 29, (3), 19-22.

Coulter, K. J., Stanton, M., & Goecker, A. D. (1990). Employment Opportunities for College Graduates in the Food and Agricultural Sciences. Summary Report of a National Assessment Conducted by the U.S. Department of Agriculture, Higher Education Program, December, 1990, Washington, DC.

Dillman, D. A. (1978). Mail and Telephone Surveys -- The Total Design Method. New York: John Wiley & Sons.

Douglas, P. & Powers, S. (1985). Factors in the Choice of Higher Educational Institutions by Students with High Ability. Journal of College Student Personnel, 26, 552-553.

Douglas, P., Powers, S., & Choroszy, M. (1983). Factors in the Choice of Higher Educational Institutions by Academically Gifted Students. Journal of College Students Personnel, 24, 540-545.

Dubravcic, E. V., Chinien, & C. A., Pratzner, F. C. (1986). Evaluating Short-Term Skill Training. Research and Development Series Now. 261. Columbus, Ohio: The National Center for Research in Vocational Education.

Erdmann, D. G. (1983). An Examination of Factors Influencing Student choice in the College Selection Process. The Journal of College Admissions, 100, 3-6.

Farm Foundation (1989). High School Student Perceptions of Agriculture College Majors and Careers. American College Testing Program, Survey Services, Department Research Division. Oakbrook, IL.

Feldhusen, J., & Sokol, L. (1982). Extra-School Programming to Meet the Needs of Gifted Youth: Super Saturday. Gifted Child Quarterly, 26, (2), 51-56.

Fox, L. (1981). Preparing gifted girls for future leadership roles. Gifted Child Today Magazine, 17, pp. 7-11.

Gentzel, T. J. (1991). PSBA Legislative Report. (Vol. 29, No. 17). Harrisburg, PA: Office of Governmental Relations.

Gustin, M. S. (1984). Special Educational Programs for the Gifted are Essential--A Superintendent's Point of View. In J. B. Jordan & J. A. Gross (Eds.), An Administrator's Handbook on Designing Programs for the Gifted and Talented. (pp. 1-5). Virginia: The Council for Exceptional Children and its Division, the Association for the Gifted.

Gwynn, D. (1990). Agriculture Schools Must Broaden Their Curricula to Attract New Groups of Students. The Chronicle of Higher Education, p. B2.

Hallowell, K. (1990, October). Selection Procedures: A National Survey of Governor's Schools. Paper presented at the meeting of the National Conference on Governor's Schools, Winston-Salem, North Carolina.

Herr, E. L. (1976). Career Education for the Gifted and Talented: Some Observations. Peabody Journal of Education, 53, 102-103.

Holland, J. L. (1985) Making Vocational Choices: A Theory of Vocational Personalities and Work Environments. (2nd ed.) Englewood Cliff, New Jersey: Prentice-Hall.

Jordaan, J. P. & Heyde, M. B. (1979). Vocational Maturity During the High School Years. New York: Teachers College Press.

Lester, M. K. & Graham, D. (1990). The Effectiveness of the Beginning Scholars Program in Attracting High Ability Students to the College of Agriculture and Home Economics. Proceedings of the 39th Annual Southern Agricultural Education Research Conference (pp. 63-71). San Antonio, TX.

Mallory, M. E., & Sommer, R. (1986). Student Image of Agriculture: Survey Highlights and Recommendations. Journal of the American Association of Teacher Educators in Agriculture. 27, (4), 14-17, 25.

Official Policy Manual of the Pennsylvania Governor's Schools of Excellence. (1990). Pennsylvania Department of Education. Harrisburg, PA.

Olszewski-Kubilius, P. (1989). Development of Academic Talent: The Role of Summer Programs. In J. L. Van Tassel-Baska & P. Olszewski-Kubilius (Eds.) Pattersn of Influence of Gifted Learners--The Home, the Self and the School. (pp 214-230). New York: Teachers College Press.

Osipow, S. H. (1973). Theories of Career Development. New Jersey: Prentice-Hall Inc.

Phi Delta Kappan, (1990). 72, (4), 264-310.

Roe, A., & Lunneborg, P. W. (1990). Personality Development and Career Choice. In D. Brown, L. Brooks, & Associates, Career Choice and Development (pp. 68-101). San Francisco: Jossey-Bass Publishers.

Silverman, K. L. (1989). Career Counseling for the Gifted. In J. L. Van Tassel-Baska & P. Olszewski-Kubilius (Eds.), Patterns of Influence on Gifted Learners--The Home, the Self and the School. (pp. 201-213). New York: Teachers College Press.

Stanley, J. C. (1989). Guiding Gifted Students in Their Academic Planning. In J. L. Van Tassel-Baska & P. Olszewski-Kubilius (Eds.), Patterns of Influence on Gifted Learners--The Home, the Self and the School. (pp. 192-200). New York: Teachers College Press.

Stansbury, D., & Coulter, K. J. (1986). Agriculture: A World of Scientific and Professional Opportunities. In J. J. Crowler (Ed.), 1986 Yearbook of Agriculture, Research For Tomorrow (pp. 302-303).

Super, D. E. (1957). The Psychology of Careers. New York: Harper and Row.

Super, D. E. (1971). A Theory of Vocational Development. In J. Peters & J. C. Hensen (Eds.), Vocational Guidance and Career Development (pp. 111-122). New York: The Macmillan Company.

Super, D. E. (1990). A Life-Span, Life-Space Approach to Career Development. In D. Brown, L. Brooks, and Associates, Career Choice and Development, (pp. 197-261). San Francisco: Jossey-Bass Publishers.

Super, D. E. & Bohn, Jr., M. J. (1970). Occupational Psychology. California: Wadsworth Publishing Company, Inc.

United States Bureau of the Census. (1950). Socioeconomic index for occupations in the detailed classification of the Bureau of the Census. Washington, DC.

Venn, G. (1971). Vocational Education for All. In J. Peters & J. C. Hensen (Eds.), Vocational Guidance and Career Development (pp. 44-51). New York: The Macmillan Company.

Wolf, D. E. (1986). Beyond the Farm Gate: An Abundance of Career Opportunities. In J. J. Crowler (Ed.), 1986 Yearbook of Agriculture, Research For Tomorrow. (pp. 304-306).

Appendix A

PROGRAM DESCRIPTION FOR

THE PENNSYLVANIA GOVERNOR'S SCHOOL FOR THE

AGRICULTURAL SCIENCES

Pennsylvania Governor's School for the **Agricultural Sciences** at Penn State

Agriculture encompasses many sciences, including engineering, animal and plant science, entomology, economics, food science, soil conservation, forest and wildlife management, and veterinary medicine.

Today's agricultural practices are being revolutionized by biotechnology and genetic engineering. Understanding the background of food, agriculture, and natural resource management is central to our national programs in food policy, nutrition education, conservation, community development, and world marketing.

Because agricultural research and policy are vital to today's global economy, Penn State, the Pennsylvania Department of Education, and the state's intermediate units are responding to a critical need for agricultural scientists. Together they are offering a five-week program for outstanding high school sophomores and juniors, including the handicapped, who have demonstrated exceptional ability in the sciences and who have a high interest in some phase of agriculture. Students will select areas of study from offerings in the science and technology of food, agriculture, and natural resources.

Areas of Study

Students will be encouraged to concentrate in the following areas of interest after exploring agricultural science and technology in core courses. Faculty will help students match their interests with specific areas of study and research. The possibilities include:

- remote sensing
- land use planning
- applied market policy
- silviculture
- insect ecology
- wildlife management
- nutrition
- food biochemistry
- animal physiology
- veterinary science
- biotechnology and genetic engineering
- photosynthesis and tissue culture
- animal breeding and health management
- environmental resource management
- computer monitoring systems

Additional Governor's School offerings include

- Seminars in agricultural science, technology, and society, including economic policy, international development, ethics, philosophy, rural sociology, and issues in sustainable agriculture;
- Independent study projects with senior faculty;
- Field trips to agricultural agencies, industries, and producers;
- Hands-on sessions in laboratories, greenhouses, barns and farms;
- Leadership development in group activities, core courses, independent study, and counseling; and
- Career and college counseling.

Program Structure

The five-week intensive program will require full participation in scheduled classes, seminars, laboratory sessions, and field trips during the day. Participation in workshops offered in the evenings and on weekends also is expected. Part of each day, students have free time to take advantage of social and recreational activities.

At the end of the school, participants will receive a special state certificate. They will not be graded or competitively ranked.

Faculty, Staff and Guest Lecturers

Faculty will include researchers, professors, business leaders, producers, and executive officers of state and federal agencies concerned with food, agriculture and natural resources. Most will be Penn State faculty or staff; however, some will come from other universities, agencies and regions.

The school has arranged to have one counselor for every ten students. Counselors will be students from Penn State and other research universities. They will serve as teaching assistants and tutors and will offer guidance and friendship to the scholars participating. Counselors live in university resident halls with the students and will take part in classes, special events, and field trips.

Agricultural scientists, agency directors, and industry executive officers, as well as graduate and undergraduate students in agriculture-related disciplines, will participate in informal discussions.

Location and Facilities

The school will use the extensive teaching and research facilities of Penn State's University Park campus. Penn State is the only university in the state that conducts a comprehensive program in agricultural research, extension, and education. The College of Agriculture maintains thousands of acres of land and forests, numerous specialized buildings, greenhouses, and laboratories, and herds of animals—from quarter horses to sheep, cattle and deer.

The university also supports a number of specialized institutes and facilities for research and teaching in the food, agricultural and natural resource sciences.

Students and counselors will be housed on campus, and all meals will be provided by the university. Students in the Governor's School for Agricultural Sciences will also have easy access to university libraries, computer laboratories, and a full range of recreational activities. Special attractions during the summer include the week-long Central Pennsylvania Festival of the Arts, Pennsylvania Centre Stage, concerts, outdoor movies and university lecture series.

Qualifications for Application

Applications will be considered from any student:

- •currently in grades 10 or 11
- •attending any secondary school prior to elected summer experience
- •with outstanding ability in science and a high interest in food, agriculture, or natural resources
- •whose parents/guardians are Pennsylvania taxpayers
- •who has not previously attended one of the six Pennsylvania Governor's Schools

Selection Criteria Include

- •Grade-point average (if available)
- •Class rank in high school (if available)
- •Letters of recommendation from science teachers, guidance counselor, and one other teacher or person who can best describe the student's current activities and abilities
- •Personal essay describing the student's own interest and experience in food, agriculture, or natural resources
- •SAT and PSAT scores (not mandatory, but strongly recommended)
- •Official high school transcript of courses and grades

Note: Adapted from: The Pennsylvania Governor's School for the Agricultural Sciences program brochure, 1991, The Pennsylvania State University, College of Agriculture, 101 Agricultural Administration Building, University Park, PA, 16802.

Appendix B

FINAL QUESTIONNAIRES

FUTURE EDUCATION AND CAREER PLANS

Which one of the following best describes your future plans following your graduation from high school? (Check one response.)

- ☐ Attend a public four-year college or technical school
- ☐ Attend a private four-year college or technical school
- ☐ Attend a public two-year college or technical school
- ☐ Attend a private two-year college or technical school
- ☐ Attend school and work
- ☐ Work full-time or part-time for someone else (specify type of job_____)
- ☐ Self employed
- ☐ Serve in the armed forces
- ☐ Care for a home or family
- ☐ Other (please specify) _____

_____

Directions for the remainder of the questionnaire.

If you plan to pursue some form of formal postsecondary education following graduation from high school, complete all questions in Part I plus all questions in Parts III, IV, and V.

If you do not plan to pursue some form of formal postsecondary education following graduation from high school, proceed to Part II and complete all questions plus complete all questions in Parts III, IV, and V.

PART I. EDUCATION AND CAREER PLANS

SECTION A. FUTURE FORMAL EDUCATION PLANS

1. Classify your choice of major when you plan to enter college in one of the following general categories. (Check only one response.)

- ☐ Agriculture
- ☐ Architecture
- ☐ Biological Sciences
- ☐ Business
- ☐ Communications
- ☐ Computer and Information Sciences
- ☐ Education
- ☐ Engineering
- ☐ Fine and Applied Arts
- ☐ Foreign Languages
- ☐ Health Professions
- ☐ Home Economics
- ☐ Letters/Humanities
- ☐ Mathematics
- ☐ Science
- ☐ Community Service
- ☐ Social Sciences
- ☐ Pre Law
- ☐ Pre Medical
- ☐ Pre Dental
- ☐ Trade /Industrial /Technical
- ☐ General Studies
- ☐ Undecided
- ☐ Other (please specify)

_____

2. When did you first seriously consider the major you indicated in the previous question (check one response)?

- ☐ Prior to freshman year in high school
- ☐ During freshman year in high school (9th grade)
- ☐ During sophomore year in high school (10th grade)
- ☐ During junior year in high school (11th grade)
- ☐ During senior year in high school (12th grade)
- ☐ I haven't decided
- ☐ Other (please specify) _____

3. What is the specific name of the major you plan to study?

_____

4. Do you plan to take a minor area of study in college?

- ☐ No
- ☐ Not certain at this time
- ☐ Yes, very definitely

↓

If yes, what is the specific name of that minor you plan to study?

_____

5. List your first, second, and third choice of institution (college, university or technical school) you would like to attend following graduation from high school.

First choice institution _____

Second choice institution _____

Third choice institution _____

6. Do you plan to attend graduate or professional school once you complete your baccalaureate degree?

- ☐ No or not sure at this time ➡➡➡➡➡➡➡➡➡➡➡➡ Go to Section "B", titled Future Career Plans, page three.
- ☐ Yes, very definitely

↓

What is the highest degree you would expect to achieve?

_____

7. Classify your choice of graduate or professional major in one of the following general categories. (Check only one response.)

- ☐ Agriculture
- ☐ Architecture
- ☐ Biological Sciences
- ☐ Business
- ☐ Communications
- ☐ Computer and Information Sciences
- ☐ Education
- ☐ Engineering
- ☐ Fine and Applied Arts
- ☐ Foreign Languages
- ☐ Health Professions
- ☐ Home Economics
- ☐ Letters/Humanities
- ☐ Mathematics
- ☐ Physical Science
- ☐ Community Service
- ☐ Social Sciences
- ☐ Law
- ☐ Medical
- ☐ Dental
- ☐ Trade /Industrial /Technical
- ☐ General Studies
- ☐ Undecided
- ☐ Other (please specify) _____

8. How certain are you regarding your choice of graduate or professional major?

- ☐ Very certain
- ☐ Fairly certain
- ☐ Not certain

SECTION B. FUTURE CAREER PLANS

1. Classify the type of career you would like when you finish your education. (Check only one response.)

- ☐ Business or industry
- ☐ Government or public service
- ☐ Private professional
- ☐ Military
- ☐ Homemaker
- ☐ Food, agriculture, and natural resources
- ☐ Undecided
- ☐ Other (please specify) _____

2. What is the job title/position you hope to acquire when you finish your education?

_____

3. When did you first seriously consider the career you indicated in the previous question? (Check only one response.)

- ☐ Prior to freshman year in high school
- ☐ During freshman year in high school (9th grade)
- ☐ During sophomore year in high school (10th grade)
- ☐ During junior year in high school (11th grade)
- ☐ During senior year in high school (12th grade)
- ☐ I haven't decided
- ☐ Other (please specify) _____

_____

SECTION C. FACTORS INFLUENCING EDUCATION AND CAREER CHOICE

1. In choosing a college major and a career, please indicate how much influence each of the following have on your choice by checking the appropriate box for each item listed. (Complete the entire College portion first [left side], then the Career portion second [right side].)

College					Career				
Strong influence	Some influence	No influence	Not applicable/ available		Strong influence	Some influence	No influence	Not applicable/ available	
☐	☐	☐	☐	Mother	☐	☐	☐	☐	
☐	☐	☐	☐	Father	☐	☐	☐	☐	
☐	☐	☐	☐	Brother/Sister	☐	☐	☐	☐	
☐	☐	☐	☐	Other Relative	☐	☐	☐	☐	
☐	☐	☐	☐	Friend	☐	☐	☐	☐	
☐	☐	☐	☐	High School Counselor	☐	☐	☐	☐	
☐	☐	☐	☐	High School Teacher	☐	☐	☐	☐	
☐	☐	☐	☐	High School Administrator	☐	☐	☐	☐	
☐	☐	☐	☐	Persons Employed in the Profession/Career	☐	☐	☐	☐	
☐	☐	☐	☐	Minister/Priest/Rabbi	☐	☐	☐	☐	
☐	☐	☐	☐	College Admissions Personnel	☐	☐	☐	☐	
☐	☐	☐	☐	College Professor	☐	☐	☐	☐	
☐	☐	☐	☐	PA Governor's School for the Agricultural Sciences	☐	☐	☐	☐	
☐	☐	☐	☐	Other (specify)_____	☐	☐	☐	☐	
☐	☐	☐	☐	Other (specify)_____	☐	☐	☐	☐	

2. How important is each of the following factors or issues in your choice of a career? (Be sure to respond in each category.)

Very important	Somewhat important	Not important	
☐	☐	☐	Personal interests
☐	☐	☐	Personal ability and skills
☐	☐	☐	Income potential of career
☐	☐	☐	Job availability
☐	☐	☐	Job security
☐	☐	☐	Personal happiness/enjoyment of work
☐	☐	☐	Being able to help others
☐	☐	☐	Potential for advancement
☐	☐	☐	Potential to hold a position with authority over others
☐	☐	☐	Prestige of the career
☐	☐	☐	Type of work environment
☐	☐	☐	Previous work experience
☐	☐	☐	Prior family work or business (father/brother/sister, etc., in this career)
☐	☐	☐	Economic outlook for this career
☐	☐	☐	Opportunity for travel and to see new places

Very important	Somewhat important	Not important	
☐	☐	☐	Opportunity to live in a geographical area I enjoy
☐	☐	☐	To be recognized as an "expert" by colleagues in my field
☐	☐	☐	To create or perform artistic or literary works
☐	☐	☐	To make a contribution to science
☐	☐	☐	To own and operate my own business
☐	☐	☐	To meet new and interesting people
☐	☐	☐	Other (please specify) _____
☐	☐	☐	Other (please specify) _____

3. How important is each of the following factors or issues to you in choosing a college major? (Be sure to respond in each category.)

Very important	Somewhat important	Not important	
☐	☐	☐	Personal interests
☐	☐	☐	Personal ability and skills
☐	☐	☐	Personal happiness
☐	☐	☐	Career interests
☐	☐	☐	Availability of jobs
☐	☐	☐	Use of creativity and originality
☐	☐	☐	Use of special talents
☐	☐	☐	Past work experience (please describe)
			_____
			_____
☐	☐	☐	Money I can earn after college
☐	☐	☐	Prestige of career I will enter with this major
☐	☐	☐	Difficulty of course/program of study
☐	☐	☐	Other (please describe) _____
			_____
			_____

4. Do you remember any specific event or experience that influenced you to choose a college major or a career? If so, please describe the event or experience in the space below.

_____

_____

_____

_____

_____

_____

5. Before you attended the Governor's School, were you considering entering a major in or related to food, agriculture, and the natural resources?

- ❑ Yes
- ❑ Not sure
- ❑ No

6. Before you attended the Governor's School, were you considering entering a career in or related to food, agriculture, and the natural resources?

- ❑ Yes
- ❑ Not sure
- ❑ No

7. Since you attended the Governor's School, have you considered entering a major in or related to food, agriculture, and the natural resources?

- ❑ Yes
- ❑ Not sure
- ❑ No

8. Since you attended the Governor's School, have you considered entering a career in or related to food, agriculture, and the natural resources?

- ❑ Yes
- ❑ Not sure
- ❑ No

PART II. IMMEDIATE CAREER PLANS

1. Classify your planned type of employment.

- ❑ Business or industry
- ❑ Government or public service
- ❑ Private professional
- ❑ Military
- ❑ Homemaker
- ❑ Food, agriculture, and natural resources
- ❑ Undecided
- ❑ Other (please specify) _____

2. What is the specific job title you plan to acquire?

_____

3. Do you plan at some time to attend college and earn a degree?

- ❑ Yes
- ❑ Not sure
- ❑ No

PART III: CURRENT PERCEPTIONS REGARDING CAREERS IN OR RELATED TO FOOD, AGRICULTURE, AND NATURAL RESOURCES

Below is a series of statements related to careers in the food, agriculture, and the natural resources. Please indicate your level of agreement with each statement by checking the appropriate box for each item.

		Strongly Agree	Agree	Neutral/Not Sure	Disagree	Strongly Disagree	No Opinion
1.	Most agriculture-related careers do not require education beyond high school.	☐	☐	☐	☐	☐	☐
2.	College graduates who major in agriculture and agriculture-related majors earn salaries as high as those earned by graduates in most other majors.	☐	☐	☐	☐	☐	
3.	Agriculture-related careers are not attractive to females.	☐	☐	☐	☐	☐	
4.	Most agriculture-related careers are in farming.	☐	☐	☐	☐	☐	
5.	Most college-level agricultural programs are vocational in nature.	☐	☐	☐	☐	☐	
6.	An agriculture-related career is not secure because the agricultural economy fluctuates.	☐	☐	☐	☐	☐	
7.	People in agriculture-related careers often work in urban areas.	☐	☐	☐	☐	☐	
8.	You should either be a farmer or have worked on a farm to enter an agriculture-related career.	☐	☐	☐	☐	☐	
9.	Graduates with college degrees in agriculture and agriculture-related majors often pursue business careers.	☐	☐	☐	☐	☐	
10.	There is limited opportunity for advancement for people employed in agriculture-related careers.	☐	☐	☐	☐	☐	
11.	Most agriculture-related careers require considerable knowledge of farms and farming.	☐	☐	☐	☐	☐	
12.	Graduates with college degrees in agriculture and agriculture-related majors are desired by many multi-national corporations.	☐	☐	☐	☐	☐	
13.	Most agricultural colleges and career opportunities are located in the Midwest United States.	☐	☐	☐	☐	☐	
14.	Most agriculture-related careers involve working outdoors.	☐	☐	☐	☐	☐	
15.	Graduates with college degrees in agriculture and agriculture-related majors are able to pursue science-oriented careers.	☐	☐	☐	☐	☐	
16.	The number of job opportunities in agriculture-related careers is declining.	☐	☐	☐	☐	☐	

		Strongly Agree	Agree	Neutral/Not Sure	Disagree	Strongly Disagree	No Opinion
17.	Most agriculture-related careers involve or require manual labor.	❑	❑	❑	❑	❑	❑
18.	Agriculture-related careers are not attractive to members of minority groups.	❑	❑	❑	❑	❑	
19.	Most agriculture-related careers require graduate-level education in fields such as genetics, microbiology, and chemistry.	❑	❑	❑	❑	❑	
20.	Most graduates of agriculture and agriculture-related programs lack skills for careers outside agriculture.	❑	❑	❑	❑	❑	
21.	People with college majors in the sciences, such as chemistry, genetics, and biology, can find employment in agriculture-related careers.	❑	❑	❑	❑	❑	
22.	Agricultural careers and career opportunities are rarely affected by world events.	❑	❑	❑	❑	❑	
23.	Most people choose careers in agriculture because they can be their own bosses (by owning their own farm, business, etc.).	❑	❑	❑	❑	❑	
24.	Most careers in agriculture are very dependent on weather conditions, such as droughts and floods.	❑	❑	❑	❑	❑	
25.	People with college majors in business, such as marketing, finance, and economics, can find employment in agriculture-related careers.	❑	❑	❑	❑	❑	
26.	Most agriculture-related careers not in farming are in the sales of farm equipment and supplies.	❑	❑	❑	❑	❑	
27.	Agricultural occupations generally are viewed with the same level of prestige by the general public as are other occupations.	❑	❑	❑	❑	❑	

PART IV. PERSONAL GROWTH AND DEVELOPMENT

1. Relative to <u>careers</u> in food, agriculture and the natural resources:

   a. <u>What</u> new knowledge or information did you gain from participation in PGSAS?

_____

_____

_____

_____

b. How have you used this new knowledge or information?

2. Relative to educational opportunities in food, agriculture and natural resources:

a. What new knowledge or information did you gain from participation in PGSAS?

b. How have you used this new knowledge or information?

3. Relative to leadership:

a. What new knowledge and/or skills did you gain from participation in PGSAS?

b. How have you used this new knowledge and/or skills?

4. Relative to interpersonal skills:

   a. What new knowledge and/or skills did you gain from participation in PGSAS?

   _____

   _____

   _____

   _____

   b. How have you used this new knowledge and/or skills?

   _____

   _____

   _____

   _____

5. Relative to communication skills:

   a. What new knowledge and/or skills did you gain from participation in PGSAS?

   _____

   _____

   _____

   _____

   b. How have you used this new knowledge and/or skills?

   _____

   _____

   _____

   _____

6. Relative to conducting research:

   a. What new knowledge and/or skills did you gain from participation in PGSAS?

   _____

   _____

   _____

b. How have you used this new knowledge and/or skills?

_____

_____

_____

_____

7. a) In terms of your own career and educational goals, how beneficial was each of the following activities in which you participated as part of your Independent Research Project (IRP)/ Independent Study Project (ISP) at PGSAS? (Check the appropriate box for each statement.)

	Extremely beneficial	Slightly beneficial	Neutral/Not sure	No benefit
Seeing how research is really done	☐	☐	☐	☐
Conducting research myself	☐	☐	☐	☐
Getting to know mentors	☐	☐	☐	☐
Attending IRP/ISP group classes	☐	☐	☐	☐
Working on IRP/ISP	☐	☐	☐	☐
Presenting IRP/ISP results to students and mentors	☐	☐	☐	☐
Writing research reports	☐	☐	☐	☐
Writing research abstracts	☐	☐	☐	☐

b) Please indicate how satisfied you are with the following aspects of the IRP/ISP. (Check the appropriate box for each statement.)

	Very satisfied	Slightly satisfied	Neutral/Not sure	Very dissatisfied
Learning research techniques	☐	☐	☐	☐
Working independently	☐	☐	☐	☐
Receiving adequate technical/scientific guidance	☐	☐	☐	☐
Working on relevant research	☐	☐	☐	☐
Being a member of a research team	☐	☐	☐	☐

8. In general, how do you personally feel you benefitted from the Governor's School experience?

_____

_____

_____

_____

_____

_____

_____

_____

_____

9. Now that you have had some time to reflect on your Governor's School experience, do you have any suggestions for enhancing the experience for future scholars?

_____

_____

_____

_____

_____

_____

_____

_____

_____

PART V. GENERAL INFORMATION

Please tell us.....

1. Sex:

❑ Male ❑ Female

2. How do you describe yourself?

❑ American Indian
❑ Black or Afro-American
❑ Hispanic
❑ Oriental or Asian American
❑ Puerto Rican
❑ White or Anglo-American
❑ Other Latin American Origin
❑ Other (specify) _____

3. Where have you lived most of your life since the age of 10?

❑ A large metropolitan city (over 500,000 in population)
❑ A medium-sized city (50,000 to 500,000 in population)
❑ A smaller city (10,000 to 49,999 in population)
❑ A town or village (under 10,000 in population)
❑ In the suburbs of a town or city
❑ In the country, outside of a city or village
❑ On a farm

4. What is your father's/male guardian's current occupation?

_____

5. What is your mother's/female guardian's current occupation?

_____

6. What is the highest level of education completed by each of your parents? (Check one in each column.)

	Father/ male guardian	Mother/ female guardian
Less than high school diploma	☐	☐
Graduated from high school or high school equivalent (GED)	☐	☐
Vocational/technical training after high school	☐	☐
Some college but didn't graduate	☐	☐
College graduate (bachelor's degree)	☐	☐
Graduate work (beyond bachelor's)	☐	☐
Don't know	☐	☐

7. What is your course of study in high school?

☐ General
☐ Business
☐ College Preparatory
☐ Vocational
☐ Vocational/College
☐ Other_____

8. Which of the following is closest to your overall high school grade-point average?

☐ A (4.0)
☐ A- (3.67 - 3.99)
☐ B+ (3.33 - 3.66)
☐ B (3.0 - 3.32)
☐ B- (2.67 - 2.99)
☐ C+ (2.33 - 2.66)
☐ C (2.0 - 2.32)
☐ D (1.0 - 1.99)

9. Are you a member of? (Check one)

☐ FFA
☐ 4-H
☐ Both FFA and 4-H
☐ Never a member of FFA or 4-H

10. What is your current high school class status?

☐ Junior
☐ Senior
☐ Other (please specify) _____

11. Which Governor's School for the Agricultural Sciences did you attend?

☐ Class of 1989
☐ Class of 1990

12. What year (grade) of high school had you completed prior to attending The Pennsylvania Governor's School for the Agricultural Sciences?

☐ Sophomore year (10th grade)
☐ Junior year (11th grade)

THANK YOU FOR TAKING THE TIME TO FILL OUT THIS QUESTIONNAIRE.
THIS INFORMATION WILL HELP US TO IMPROVE THE
PENNSYLVANIA GOVERNOR'S SCHOOL FOR THE AGRICULTURAL SCIENCES.

Please return completed questionnaire in the enclosed envelope to:

Ms. Marianne L. Houser
101 Agricultural Administration Building
The Pennsylvania State University
University Park, PA 16802

— — —

(This number used only to follow up nonrespondents)

CHOICE OF COLLEGE MAJOR AND CAREER INFORMATION PLANS

Which one of the following best describes what you did during your first year after high school? (Check one response.)

- ☐ Attended a public four-year college or university
- ☐ Attended a private four-year college or university
- ☐ Attended a public two-year college or technical school
- ☐ Attended a private two-year college or technical school
- ☐ Attended school and worked
- ☐ Worked full-time or part-time for someone else (specify type of job_____)
- ☐ Self employed
- ☐ Served in the armed forces
- ☐ Cared for a home or family
- ☐ Other (please specify) _____

_____

Directions for the remainder of the questionnaire:

If you have pursued some form of formal postsecondary education since graduation from high school, complete all questions in Part I plus all questions in Parts III, IV, and V.

If you <u>have not</u> pursued some form of formal postsecondary education since graduation from high school, proceed to Part II and complete all questions plus all questions in Parts III, IV, and V.

PART I. EDUCATION AND CAREER PLANS

SECTION A. FORMAL EDUCATION INVOLVEMENT SINCE HIGH SCHOOL

1. What is your current class standing in college?

- ☐ Freshman
- ☐ Sophomore
- ☐ Junior
- ☐ Senior
- ☐ Graduated
- ☐ Other (please specify) _____

2. Which of the following is closest to your overall college grade-point average?

☐	A (4.0)	☐	B- (2.67 - 2.99)
☐	A- (3.67 - 3.99)	☐	C+ (2.33 - 2.66)
☐	B+ (3.33 - 3.66)	☐	C (2.0 - 2.32)
☐	B (3.0 - 3.32)	☐	D (1.0 - 1.99)

3. Classify your current major of study in one of the following general categories. (Check only one response.)

- ☐ Agriculture
- ☐ Architecture
- ☐ Biological Sciences
- ☐ Business
- ☐ Communications
- ☐ Computer and Information Sciences
- ☐ Education
- ☐ Engineering
- ☐ Fine and Applied Arts
- ☐ Foreign Languages
- ☐ Health Professions
- ☐ Home Economics
- ☐ Letters/Humanities
- ☐ Mathematics
- ☐ Science
- ☐ Community Service
- ☐ Social Sciences
- ☐ Pre Law
- ☐ Pre Medical
- ☐ Pre Dental
- ☐ Trade /Industrial /Technical
- ☐ General Studies
- ☐ Undecided
- ☐ Other (please specify) _____

4. When did you first seriously consider the major you indicated in the previous question? (Check one response.)

- ☐ Prior to freshman year in high school
- ☐ During freshman year in high school (9th grade)
- ☐ During sophomore year in high school (10th grade)
- ☐ During junior year in high school (11th grade)
- ☐ During senior year in high school (12th grade)
- ☐ After senior year in high school, but before entering college
- ☐ During college
- ☐ I haven't decided
- ☐ Other (please specify) _____

5. What is the specific name of your current major of study?

_____

6. Have you changed your major since entering college?

☐ No ☐ Yes

⬇

If yes, how many times have you changed your major since entering college?

- ☐ One time
- ☐ Two times
- ☐ Three times
- ☐ Greater than three times

7. Have you selected a minor?

- ☐ No
- ☐ Yes

⬇

If yes, what is the specific name of your current minor of study?

_____

8. What is the name of the institution (college, university or technical school) you are currently attending?

_____

SECTION B. FUTURE EDUCATIONAL PLANS

1. Do you plan to attend graduate or professional school once you complete your baccalaureate degree?

- ☐ No, or not sure at this time ⟶ Proceed to section "C" titled Future Career Plans
- ☐ Yes, very definitely

⬇

What is the highest degree you now expect to achieve?

_____

2. Classify your choice of graduate or professional major in one of the following general categories. (Check only one response.)

- ☐ Agriculture
- ☐ Architecture
- ☐ Biological Sciences
- ☐ Business
- ☐ Communications
- ☐ Computer and Information Sciences
- ☐ Education
- ☐ Engineering
- ☐ Fine and Applied Arts
- ☐ Foreign Languages
- ☐ Health Professions
- ☐ Home Economics
- ☐ Letters/Humanities
- ☐ Mathematics
- ☐ Science
- ☐ Community Service
- ☐ Social Sciences
- ☐ Law
- ☐ Medical
- ☐ Dental
- ☐ Trade /Industrial /Technical
- ☐ General Studies
- ☐ Undecided
- ☐ Other (please specify)

_____

3. How certain are you regarding your choice of a graduate or professional major?

- ☐ Very certain
- ☐ Fairly certain
- ☐ Not certain

SECTION C. FUTURE CAREER PLANS

1. Classify the type of career you would like when you finish your education. (Check only one response.)

- ☐ Business or industry
- ☐ Government or public service
- ☐ Private professional
- ☐ Military
- ☐ Homemaker
- ☐ Food, agriculture, and natural resources
- ☐ Undecided
- ☐ Other (please specify) _____

2. What is the job title/position you hope to acquire when you finish your education?

_____

3. When did you first seriously consider the career you indicated in the previous question? (Check only one response.)

- ☐ Prior to freshman year in high school
- ☐ During freshman year in high school (9th grade)
- ☐ During sophomore year in high school (10th grade)
- ☐ During junior year in high school (11th grade)
- ☐ During senior year in high school (12th grade)
- ☐ After senior year in high school, but before starting college
- ☐ While attending college
- ☐ I haven't decided yet
- ☐ Other (please specify) _____

_____

SECTION D. FACTORS IN EDUCATION AND CAREER CHOICE

1. When choosing a college major and a career, please indicate how much influence each of the following had on your choice by checking the appropriate box for each item listed. (Complete the entire College portion first [left side], then complete the Career portion second [right side].)

College					Career				
Strong influence	Some influence	No influence	Not applicable/ available		Strong influence	Some influence	No influence	Not applicable/ available	
☐	☐	☐	☐	Mother	☐	☐	☐	☐	
☐	☐	☐	☐	Father	☐	☐	☐	☐	
☐	☐	☐	☐	Brother/Sister	☐	☐	☐	☐	
☐	☐	☐	☐	Other Relative	☐	☐	☐	☐	
☐	☐	☐	☐	Friend	☐	☐	☐	☐	
☐	☐	☐	☐	High School Counselor	☐	☐	☐	☐	
☐	☐	☐	☐	High School Teacher	☐	☐	☐	☐	
☐	☐	☐	☐	High School Administrator	☐	☐	☐	☐	
☐	☐	☐	☐	Persons Employed in the Profession/Career	☐	☐	☐	☐	
☐	☐	☐	☐	Minister/Priest/Rabbi	☐	☐	☐	☐	
☐	☐	☐	☐	College Admissions Personnel	☐	☐	☐	☐	
☐	☐	☐	☐	College Professor	☐	☐	☐	☐	
☐	☐	☐	☐	PA Governor's School for the Agricultural Sciences	☐	☐	☐	☐	
☐	☐	☐	☐	Other (specify)_____	☐	☐	☐	☐	
☐	☐	☐	☐	Other (specify)_____	☐	☐	☐	☐	

2. How important were each of the following factors or issues in your choice of a career? (Be sure to respond to each statement.)

Very important	Somewhat important	Not important	
☐	☐	☐	Personal interests
☐	☐	☐	Personal ability and skills
☐	☐	☐	Income potential of career
☐	☐	☐	Job availability
☐	☐	☐	Job security
☐	☐	☐	Personal happiness/enjoyment of work
☐	☐	☐	Being able to help others
☐	☐	☐	Potential for advancement
☐	☐	☐	Potential to hold a position with authority over others
☐	☐	☐	Prestige of the career
☐	☐	☐	Type of work environment
☐	☐	☐	Previous work experience
☐	☐	☐	Prior family work or business (father/brother/sister, etc., in this career)
☐	☐	☐	Economic outlook for this career
☐	☐	☐	Opportunity for travel and to see new places
☐	☐	☐	Opportunity to live in a geographical area I enjoy
☐	☐	☐	To be recognized as an "expert" by colleagues in my field
☐	☐	☐	To create or perform artistic or literary works
☐	☐	☐	To make a contribution to science
☐	☐	☐	To own and operate my own business
☐	☐	☐	To meet new and interesting people
☐	☐	☐	Other (please specify) _____
☐	☐	☐	Other (please specify) _____

3. How important were each of the following factors or issues to you in choosing a college major? (Be sure to respond to each statement.)

Very important	Somewhat important	Not important	
☐	☐	☐	Personal interests
☐	☐	☐	Personal ability and skills
☐	☐	☐	Personal happiness
☐	☐	☐	Career interests
☐	☐	☐	Availability of jobs
☐	☐	☐	Use of creativity and originality
☐	☐	☐	Use of special talents
☐	☐	☐	Past work experience (please describe)
			_____
			_____
☐	☐	☐	Money I can earn after college
☐	☐	☐	Prestige of career I will enter with this major
☐	☐	☐	Difficulty of course/program of study
☐	☐	☐	Other (please describe) _____
			_____

4. Do you remember any specific event or experience that influenced you to choose a college major or a career? If so, please describe the event or experience in the space below.

_____

_____

_____

_____

_____

_____

5. Before you attended the Governor's School, were you considering entering a major in or related to food, agriculture, and the natural resources?

- ☐ Yes
- ☐ Not sure
- ☐ No

6. Before you attended the Governor's School, were you considering entering a career in or related to food, agriculture, and the natural resources?

- ☐ Yes
- ☐ Not sure
- ☐ No

7. After you attended the Governor's School, did you consider entering a major in or related to food, agriculture, and the natural resources?

- ☐ Yes
- ☐ Not sure
- ☐ No

8. After you attended the Governor's School, did you consider entering a career in or related to food, agriculture, and the natural resources?

- ☐ Yes
- ☐ Not sure
- ☐ No

PART II. EMPLOYMENT

1. Classify your current type of employment.

- ☐ Business or industry
- ☐ Government or public service
- ☐ Private professional
- ☐ Military
- ☐ Homemaker
- ☐ Food, agriculture, and natural resources
- ☐ Unemployed
- ☐ Other (specify):_____

2. What is the specific job title?

_____

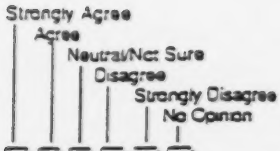
3. Do you plan at some time to attend college and earn a degree?

- ☐ Yes
- ☐ Not sure
- ☐ No

PART III. CURRENT PERCEPTIONS REGARDING CAREERS IN OR RELATED TO FOOD, AGRICULTURE, AND NATURAL RESOURCES

Below is a series of statements related to careers and to food, agriculture and the natural resources. Please indicate your level of agreement with each statement by checking the appropriate box for each item.

		Strongly Agree	Agree	Neutral/Not Sure	Disagree	Strongly Disagree	No Opinion
1.	Most agriculture-related careers do not require education beyond high school.	☐	☐	☐	☐	☐	☐
2.	College graduates who major in agriculture and agriculture-related majors earn salaries as high as those earned by graduates in most other majors.	☐	☐	☐	☐	☐	☐
3.	Agriculture-related careers are not attractive to females.	☐	☐	☐	☐	☐	☐
4.	Most agriculture-related careers are in farming.	☐	☐	☐	☐	☐	☐
5.	Most college-level agricultural programs are vocational in nature.	☐	☐	☐	☐	☐	☐
6.	An agriculture-related career is not secure because the agricultural economy fluctuates.	☐	☐	☐	☐	☐	☐
7.	People in agriculture-related careers often work in urban areas.	☐	☐	☐	☐	☐	☐
8.	You should either be a farmer or have worked on a farm to enter an agriculture-related career.	☐	☐	☐	☐	☐	☐
9.	Graduates with college degrees in agriculture and agriculture-related majors often pursue business careers.	☐	☐	☐	☐	☐	☐



10. There is limited opportunity for advancement for people employed in agriculture-related careers. ☐☐☐☐☐☐

11. Most agriculture-related careers require considerable knowledge of farms and farming. ☐☐☐☐☐☐

12. Graduates with college degrees in agriculture and agriculture-related majors are desired by many multi-national corporations. ☐☐☐☐☐☐

13. Most agricultural colleges and career opportunities are located in the Midwest United States. ☐☐☐☐☐☐

14. Most agriculture-related careers involve working outdoors. ☐☐☐☐☐☐

15. Graduates with college degrees in agriculture and agriculture-related majors are able to pursue science-oriented careers. ☐☐☐☐☐☐

16. The number of job opportunities in agriculture-related careers is declining. ☐☐☐☐☐☐

17. Most agriculture-related careers involve or require manual labor. ☐☐☐☐☐☐

18. Agriculture-related careers are not attractive to members of minority groups. ☐☐☐☐☐☐

19. Most agriculture-related careers require graduate-level education in fields such as genetics, microbiology, and chemistry. ☐☐☐☐☐☐

20. Most graduates of agriculture and agriculture-related programs lack skills for careers outside agriculture. ☐☐☐☐☐☐

21. People with college majors in the sciences, such as chemistry, genetics, and biology, can find employment in agriculture-related careers. ☐☐☐☐☐☐

22. Agricultural careers and career opportunities are rarely affected by world events. ☐☐☐☐☐☐

23. Most people choose careers in agriculture because they can be their own bosses (by owning their own farm, business, etc.). ☐☐☐☐☐☐

24. Most careers in agriculture are very dependent on weather conditions, such as droughts and floods. ☐☐☐☐☐☐

25. People with college majors in business, such as marketing, finance, and economics, can find employment in agriculture-related careers. ☐☐☐☐☐☐

26. Most agriculture-related careers not in farming are in the sales of farm equipment and supplies. ☐☐☐☐☐☐

27. Agricultural occupations generally are viewed with the same level of prestige by the general public as are other occupations. ☐☐☐☐☐☐

Part IV. PERSONAL GROWTH AND DEVELOPMENT

1. Relative to careers in food, agriculture and the natural resources:

   a. What new knowledge or information did you gain from participation in PGSAS?

   _____
   _____
   _____
   _____

   b. How have you used this new knowledge or information?

   _____
   _____
   _____
   _____

2. Relative to educational opportunities in food, agriculture and natural resources:

   a. What new knowledge or information did you gain from participation in PGSAS?

   _____
   _____
   _____
   _____

   b. How have you used this new knowledge or information?

   _____
   _____
   _____
   _____

3. Relative to leadership:

   a. What new knowledge and/or skills did you gain from participation in PGSAS?

   _____
   _____
   _____
   _____

b. How have you used this new knowledge and/or skills?

4. Relative to interpersonal skills:

a. What new knowledge and/or skills did you gain from participation in PGSAS?

b. How have you used this new knowledge and/or skills?

5. Relative to communication skills:

a. What new knowledge and/or skills did you gain from participation in PGSAS?

b. How have you used this new knowledge and/or skills?

6. Relative to conducting research:

   a. What new knowledge and/or skills did you gain from participation in PGSAS?

   _____

   _____

   _____

   _____

   b. How have you used this new knowledge and/or skills?

   _____

   _____

   _____

   _____

7. a) In terms of your own career and educational goals, how beneficial was each of the following activities in which you participated as part of your Independent Research Project (IRP)/Independent Study Project (ISP) at PGSAS? (Check the appropriate box for each statement.)

	Extremely beneficial	Slightly beneficial	Neutral/Not sure	No benefit
Seeing how research is really done	☐	☐	☐	☐
Conducting research myself	☐	☐	☐	☐
Getting to know mentors	☐	☐	☐	☐
Attending IRP/ISP group classes	☐	☐	☐	☐
Working on IRP/ISP	☐	☐	☐	☐
Presenting IRP/ISP results to students and mentors	☐	☐	☐	☐
Writing research reports	☐	☐	☐	☐
Writing research abstracts	☐	☐	☐	☐

b) Please indicate how satisfied you were with the following aspects of the IRP/ISP. (Check the appropriate box for each statement.)

	Very satisfied	Slightly satisfied	Neutral/Not sure	Very dissatisfied
Learning research techniques	☐	☐	☐	☐
Working independently	☐	☐	☐	☐
Receiving adequate technical/scientific guidance	☐	☐	☐	☐
Working on relevant research	☐	☐	☐	☐
Being a member of a research team	☐	☐	☐	☐

8. In general, how did you benefit from the Governor's School experience?

9. Now that you have had some time to reflect on your Governor's School experience, do you have any suggestions for enhancing the experience for future scholars?

PART V: GENERAL INFORMATION

Please tell us.....

1. Sex:

☐ Male ☐ Female

2. How do you describe yourself?

☐ American Indian
☐ Black or Afro-American
☐ Hispanic
☐ Oriental or Asian American
☐ Puerto Rican
☐ White or Anglo-American
☐ Other Latin American Origin
☐ Other (specify) _____

3. Where have you lived most of your life since the age of 10?

- ☐ A large metropolitan city (over 500,000 in population)
- ☐ A medium-sized city (50,000 to 500,000 in population)
- ☐ A smaller city (10,000 to 49,999 in population)
- ☐ A town or village (under 10,000 in population)
- ☐ In the suburbs of a town or city
- ☐ In the country, outside of a city or village
- ☐ On a farm

4. What is your father's/male guardian's current occupation?

_____

5. What is your mother's/female guardian's current occupation?

_____

6. What is the highest level of education completed by each of your parents? (Check one in each column.)

	Father/ male guardian	Mother/ female guardian
Less than high school diploma	☐	☐
Graduated from high school or high school equivalent (GED)	☐	☐
Vocational/technical training after high school	☐	☐
Some college but didn't graduate	☐	☐
College graduate (bachelor's degree)	☐	☐
Graduate work (beyond bachelor's)	☐	☐
Don't know	☐	☐

7. What was your course of study in high school?

- ☐ General
- ☐ Business
- ☐ College Preparatory
- ☐ Vocational
- ☐ Vocational/College
- ☐ Other_____

8. Which of the following was closest to your overall high school grade-point average?

- ☐ A (4.0)
- ☐ A- (3.67 - 3.99)
- ☐ B+ (3.33 - 3.66)
- ☐ B (3.0 - 3.32)
- ☐ B- (2.67 - 2.99)
- ☐ C+ (2.33 - 2.66)
- ☐ C (2.0 - 2.32)
- ☐ D (1.0 - 1.99)

9. While attending high school were you a member of? (Check one.)

- ☐ FFA
- ☐ 4-H
- ☐ Both FFA and 4-H
- ☐ Never a member of FFA or 4-H

10. Which class of Governor's School for the Agricultural Sciences did you attend?

- ☐ Class of 1986
- ☐ Class of 1987
- ☐ Class of 1988
- ☐ Class of 1989
- ☐ Class of 1990

11. What year (grade) of high school had you completed prior to attending The Pennsylvania Governor's School for the Agricultural Sciences?

- ☐ Sophomore year (10th grade)
- ☐ Junior year (11th grade)

12. If you received merit scholar recognition in high school, indicate the highest level of recognition received. (Check one.)

- ☐ Commendable
- ☐ Semi-finalist
- ☐ Finalist

THANK YOU FOR TAKING THE TIME TO FILL OUT THIS QUESTIONNAIRE.
THIS INFORMATION WILL HELP US TO IMPROVE THE
PENNSYLVANIA GOVERNOR'S SCHOOL FOR THE AGRICULTURAL SCIENCES.

Please return completed questionnaire in the enclosed envelope to:

Ms. Marianne L. Houser
101 Agricultural Administration Building
The Pennsylvania State University
University Park, PA 16802

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(This number used only to follow up nonrespondents)

Appendix C

LETTERS OF CORRESPONDENCE

PENNSTATE

(814) 865-1775

Senior Vice President for Research and
Dean of the Graduate School
Office for the Protection of Human Subjects

The Pennsylvania State University
115 Kern Graduate Building
University Park, PA 16802

Date: November 29, 1990

From: Lorraine H. Mulfinger, Compliance Coordinator

To: Marianne L. Houser

Subject: Proposal for Use of Human Subjects in Research - Exemption

"Influence of Pennsylvania's Governor's School for the Agricultural Sciences (PGSAS) on Scholars' Career Choice, Self Development and Perceptions of Agricultural Careers"

I have examined your proposal for use of human subjects in your research. Subjects in your research are at minimal risk. You may proceed with your study.

NOTE: Please be aware that the parental consent forms for minors involved in this study should be returned prior to the mailing of surveys to these students, or the survey should be mailed with the parental consent form but in one envelope addressed to the parent.

Attached are mailing labels you can use to forward to 114 Kern Building the original, signed informed consent forms obtained from the subjects of your study. Contact this office if you need more labels.

Subjects must receive a copy of the informed consent form and the written explanation of your study that was submitted to this office for review.

By accepting this decision you agree to notify this office of (1) any additions or changes in procedures for your study that modify the subjects' risks in any way and (2) any events that affect the safety or well-being of subjects.

LHM/kje

Attachments

cc: E. P. Yoder
B. E. Bowen
C. R. Krueger

An Equal Opportunity University

PENNSTATE

(814) 865-7521

Office for Resident Education
College of Agriculture

The Pennsylvania State University
101 Agricultural Administration Building
University Park, PA 16802

December 21, 1990

Dear Governor's School Scholar (Personalized):

Greetings from the Pennsylvania Governor's School for the Agricultural Sciences(PGSAS) and the College of Agriculture at Penn State. I hope that have have had a successful fall and that you are ready to relax and enjoy the 1990 holiday season.

Currently we are in the process of evaluating PGSAS. As a former participant in the school you can provide us with useful information relative to the evaluation. The primary purpose is to determine if the PGSAS is meeting the objectives established by the Department of Education and the College of Agriculture at Penn State. The specific objectives of the study are:

1. To determine if PGSAS provides participants with courses, field trips, guest lectures, hands on experiences, new technologies, and other activities that expand their knowledge of food, agriculture, and the natural resources.
2. To determine if PGSAS informs participants of the array of career opportunities available.
3. To determine if the PGSAS experience contributes to or enhances a participant's leadership, communication, problem solving, and interpersonal skills, and if they apply these skills upon returning to their home districts.

We estimate it will take approximately 45 minutes to one hour to complete the questionnaire. Your participation is voluntary and we hope you will choose to participate in the study and provide us with information critical to the evaluation of PGSAS. You will notice a code number on the back cover of the questionnaire. Be assured this is to be used only to follow-up non-respondents. At no time in the compilation of information will individual names be associated with individual responses. If you have questions or concerns please feel free to contact me either at the office, (814) 865-7521, or at home, (814) 231-1448 (preferably before 10:00 p.m.). Please return the completed questionnaire by **January 10, 1991.**

Best wishes for a happy new year and a successful spring . We look forward to seeing you at PGSAS alumni day next summer.

Sincerely,

Marianne L. Houser
Instructor,
Department of Agricultural and Extension Education
The Pennsylvania State University

An Equal Opportunity University

VITA

Name:	Marianne Lamb Houser	Place of Birth:	Coatesville, PA
Date of Birth:	February 27, 1957	Married:	William Houser, November 26, 1988

Education

Ph.D.		The Pennsylvania State University Major: Agricultural Education
M.Ed.	1983	The Pennsylvania State University Major: Agricultural Education
B.S.	1979	Delaware Valley College of Science and Agriculture Major: Animal Husbandry Minor: Laboratory Animal Science

Work Experience

1986 - Present	Coordinator of Undergraduate Recruitment and Instructor, Department of Agricultural and Extension Education, The Pennsylvania State University, University Park, Pennsylvania.
1990 - Present	University Director, Pennsylvania Governor's School for the Agricultural Sciences, University Park, Pennsylvania.
1986 - 1990	Assistant Director, Pennsylvania Governor's School for the Agricultural Sciences, University Park, Pennsylvania.
1980 - 1986	W.B. Saul High School of Agricultural Sciences, Philadelphia, Pennsylvania: 1985 - 1986 Director of Agricultural Activities 1984 - 1985 Agricultural Coordinator 1980 - 1984 Vocational Agriculture Teacher
	1983 - 1985 Instructor, The Pennsylvania State University
1980	Vocational Agriculture Teacher, Pequea Valley High School, Kinzers, Pennsylvania

Memberships/Recognition

1991 Andrew Kozak - Phi Delta Kappa Fellowship
American Association of Teacher Educators in Agriculture
Gamma Sigma Delta
National Association of College and Teachers of Agriculture
Omicron Tau Theta
Phi Delta Kappa